

OCCURRENCE OF TWO PALAEARCTIC SPECIES OF
CLEPSIS GUENÉE, *C. SPECTRANA* TREITSCHKE AND
C. CONSIMILANA (HÜBNER) (TORTRICIDAE), IN
BRITISH COLUMBIA, CANADA

P. T. DANG

Canadian Forest Service, Natural Resources Canada, c/o The Canadian National
Collection of Insects, Centre for Land and Biological Resources Research, K. W. Neatby
Building, Ottawa, Ontario K1A 0C6, Canada

R. W. DUNCAN

Canadian Forest Service, Natural Resources Canada, Pacific Forestry Centre, 506 West
Burnside Road, Victoria, British Columbia V8Z 1M5, Canada

AND

S. FITZPATRICK

Pacific Agriculture Research Centre, Agriculture and Agri-Food Canada, 6660 N.W.
Marine Drive, Vancouver, British Columbia V6T 1X2, Canada

ABSTRACT. The occurrence in North America of two species of *Clepsis* Guenée native to Europe and part of Asia, *C. spectrana* Treitschke and *C. consimilana* (Hübner), is reported. Diagnoses, descriptions of adults, and illustrations of wing patterns and male and female genitalia are provided for identification of these two species in North America.

Additional key words: distributional records, host range, genitalic illustrations.

Clepsis spectrana Treitschke is of Palaearctic origin, widely distributed from England through most of Europe and extending east as far as Turkey, trans-Caucasus, and Kazakhstan. Recently, a number of specimens of this species were collected in British Columbia, Canada, on cultivated raspberry, currant, white spruce, and white cedar, prompting this report. A single specimen of this species in the Canadian National Collection of Insects and Arachnids (CNC) was collected in 1950 from Abbotsford, British Columbia. Although *C. spectrana* evidently has existed in the Vancouver area for more than 45 years, it has remained unrecognized until today. This species is a prime candidate to become a serious pest in North America because its larvae are highly polyphagous. Various agriculture crops, such as blueberry, raspberry, currant, or even forest trees, such as species of spruce and cedar, could be seriously affected if an outbreak of this pest should occur. It is already an economically important pest of currants in Delta, British Columbia.

A second Palaearctic species, *C. consimilana* (Hübner), was recently discovered in British Columbia. The larvae were collected on *Taxus baccata* L. (Taxaceae) and reared through to adults. Although *C. consimilana* was reported in North America (eastern United States) many years

ago (Klots 1941), and fairly recently in Oregon (Powell 1986), its discovery in British Columbia is the first distributional record in Canada, and could well represent a recent introduction. This species was known by Klots (1941) as *Tortrix unifasciana* Duponchel and by Powell (1983) as *Clepsis unifasciana* (Duponchel). In Eurasia, *C. consimilana* has a distribution similar to that of *C. spectrana*; however, it has also been recorded from eastern Siberia and Madagascar (Bradley et al. 1973, Kuznetsov 1978).

MATERIALS AND METHODS

The present study is based on specimens from British Columbia, collected and reared by personnel of the Pacific Agriculture Research Centre, Vancouver, and the Pacific Region Canadian Forest Service. Four male specimens from the British Isles and two specimens (1♂, 1♀) of *C. spectrana* from Germany, and nine specimens (7♂, 2♀) of *C. consimilana* from England were also examined and compared to help confirm the identity of these specimens. All specimens examined are deposited in the CNC.

Selected adults were photographed to illustrate wing shape and patterns. Genitalia were dissected (Dang 1993), studied, and drawn while submerged in glycerin. They were then mounted on microscope slides in Canada balsam for preservation and storage. In the "Material Studied" sections below, the number in parentheses after the number of males or females indicates the number of genitalia dissected and examined.

The following descriptions are designed to assist forest and agriculture workers in North America identify these two non-native species of *Clepsis* so that dispersal, populations, and new host ranges can be monitored and, if required, necessary control measures can be effectively implemented.

Clepsis spectrana (Treitschke)

Tortrix spectrana Treitschke 1830. Schmett. Eur. 8:77.

Clepsis spectrana, Bradley, et al. 1973:122; Kuznetsov 1978:360; Razowski 1979:147.

Diagnosis. This species is superficially similar to the North American *C. fucana* (Walsingham), especially in the forewing color and markings. However, the forewing markings are more reddish brown; the medial fascia, in particular, is more uniformly colored in *C. fucana* as opposed to dark brown and darker and better defined anteriorly in *C. spectrana*; in addition to differences in markings, the costal fold is present in the male of *C. spectrana*, absent in *C. fucana*. Furthermore, these two species are easily distinguished from one another on the basis of the following genital differences: valva distinctly longer than wide, at least 1.5 times largest width, aedeagus entirely smooth, and corpus bursae with well-developed, clawlike signum in *C. spectrana*, as apposed to valva as long as wide, aedeagus with sharp teeth at subapical area, and corpus bursae without signum in *C. fucana*.

Description. Generally a light orange-yellow to light yellowish brown species with distinct dark brown, oblique medial fascia and costal spots. *Male*: length of forewing 8.0–10.5

mm. Head: Scales on vertex semierect, concolorous with ground color of forewing; antennal flagellum mostly pale, concolorous with vertex, dotted with scattered dark brown scales; labial palpus brown laterally and pale yellow mesally. Medial and laterodorsal areas of notum concolorous with ground color and marking color of forewing respectively. Forewing (Fig. 4A) fairly truncate apically with well-developed costal fold; ground color light orange-yellow to light yellowish brown; markings distinct, dark brown: medial fascia obliquely extended from one-third from base of costa to one-third from tornal angle of posterior margin, portion from costa to outer margin of discal cell well defined, dark brown, remaining portion fairly diffuse, lighter brown; basal margin of fascia somewhat jagged; subterminal fascia reduced to well-defined, large, subterminal, nearly semicircular, dark brown spot at costa; basal and subbasal areas nearly concolorous with ground color, occasionally slightly darker, brownish orange-yellow, except for mostly dark brown costal area along costal fold. In pale specimens, posterior portion of medial fascia, and laterodorsal area of notum nearly concolorous with ground color of forewing or medial region of notum resulting in forewing with overall pale orange-yellow ground color and two prominent dark brown costal spots. Hindwing fairly uniformly colored, pale yellow to light grayish yellowish brown. *Female*: without costal fold, otherwise mostly similar to male.

Male genitalia (Figs. 1A–D): uncus well developed and sclerotized, depressed, abruptly bent at base, L-shaped in lateral view, nearly parallel sided except for slight constriction near base, 4 times as long as greatest width, with numerous fine setae on dorsal and ventral sides; apex round. Socius moderately developed, with rectangular, well-sclerotized basal portion and small, short, fleshy, thumb-shaped, mesally directed, finely setose distal portion. Gnathos well developed and sclerotized, joined distomedially forming wishbone-shaped structure. Valva parabolic in outline, distinctly longer than wide; basal process well developed, moderately sclerotized, spherical, bearing numerous spines dorsally; sacculus well sclerotized, narrowed distally into sharp point. Aedeagus, well sclerotized, fairly straight, somewhat conical, widest anteriorly; posterior half obliquely tapered into sharp point apicoventrally. Vesica as long as aedeagus, cylindrical, with small, fleshy, finger-shaped distoventral, ventrally-directed diverticulum and with cluster of 5 large, slender, attenuate spindle-shaped, and 3–4 thinner, seta-shaped cornuti loosely clustered at around right laterodistal and distal areas just dorsad of diverticulum; gonopore located distodorsally.

Female genitalia (Figs. 3A–Aa): Anal papillae elongate, foot-shaped, somewhat tuberculous, with fine setae. Sterigma weakly sclerotized, trapezoidal, much wider posteriorly. Ostium bursae round. Antrum narrow anteriorly, mostly membranous except lateral sides of anterior half thickly sclerotized with microscopic transverse ridges; inner surface of dorsal side of posterior half with posteriorly directed spicules. Ductus bursae anterad of antrum narrow, cylindrical, membranous, 4 times as long as anal papillae. Corpus bursae small, irregular potato-shaped, membranous. Signum large, well sclerotized, compressed, claw-like with finely serrate inner edge.

Material Studied. CANADA: BRITISH COLUMBIA: Pitt Meadows, 31.V.1950, (blueberry), 1♀ (1), D. Gillespies; Abbotsford, 22.IV.1991, (reared from *Picea glauca*), 1♂ (1), 1♀ (1), R. Duncan; Maple Ridge, IV.1994, (reared from *Thuja occidentalis*), 1♂, R. Duncan; Abbotsford, 5–10.III.1992, (reared from currant), 3♂, 11.V.1993, (reared from raspberry), 1♂, J. Troubridge; Lower Fraser Valley, IV.1993, (reared from currant), 2♀, 5♂, S. Fitzpatrick. ENGLAND: Oxford, 1890, 3♂, 1900, 1♂. GERMANY: Lichterfelde, Mark Brandenburg, 25.VI.1929, 1♂ (1), 1♀ (1), (on *Epilobium hirsutum* L.), H. G. Amsel.

Biology. In Europe and western Asia, this species has been reported to feed on grape, *Spiraea*, *Potentilla*, *Aster*, *Urtica*, *Euphorbia*, *Cicuta*, *Epilobium*, *Comarum*, comfrey, sorer, iris, cypress, field cress, and most herbaceous plants in semi-aquatic habitats such as fens and marshes, and on cultivated plants, such as *Cyclamen*, strawberry, hops and *Pelargonium* (Bradley et al. 1973, Kuznetsov 1978, Razowski 1979). In British Columbia, the larvae have been reared on or collected from white spruce, white cedar, blueberry, raspberry, and currant. Adults are nocturnal and readily attracted to lights. In Europe, adults fly during May–July; in British Columbia, adults are found from late March until early August. Larvae found in March apparently belong to the fall generation of the previous year that overwintered; those found from May to August represent current year generations. There are 2–3 generations a year in British Columbia.

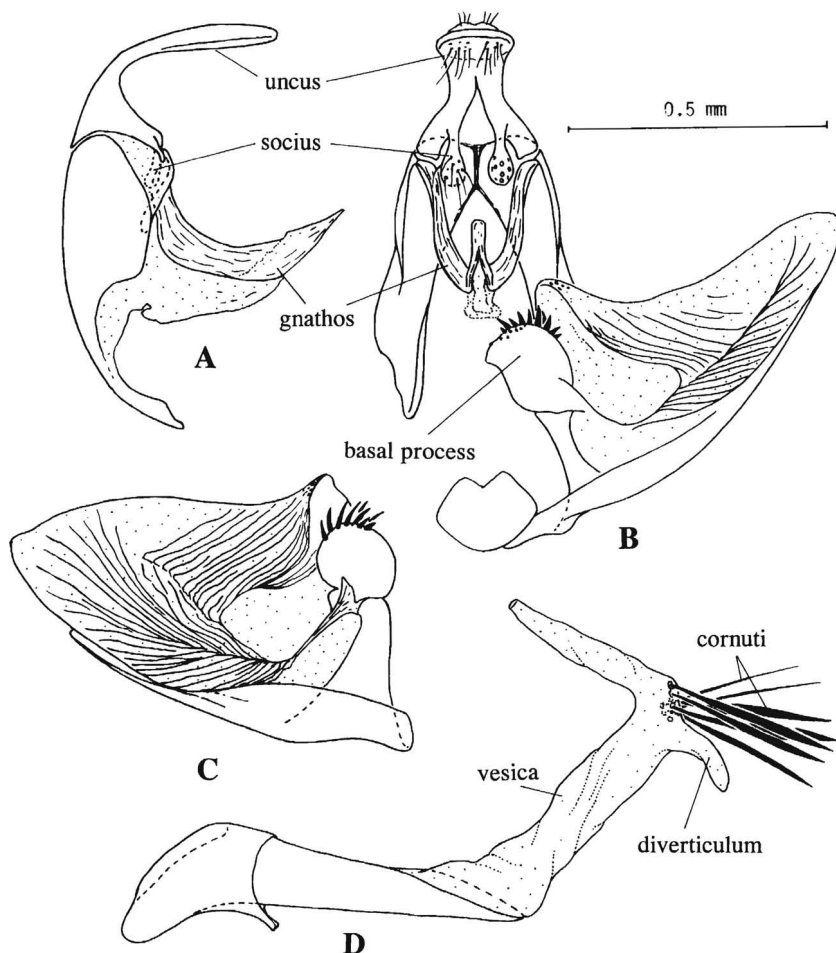


FIG. 1. Male genitalia of *Clepsia spectrana* (Treischke). A, lateral aspect of dorsal components of genitalia; B, posteroventral aspect of genitalia with left valva and aedeagus removed; C, mesal aspect of left valva; D, lateral aspect of aedeagus.

Clepsia consimilana (Hübner)

C. consimilana Hübner (1814–1817). Samml. eur. Schmet., tab. 38, fig. 239.

Clepsia consimilana, Bradley et al. 1973:124; Kuznetsov 1978:363; Razowski 1979:162; Powell 1986:165.

Diagnosis. *Clepsia consimilana* is distinguished from its North American counterparts by the deep brown and immaculate, or nearly so, forewing, and by the structure of the genitalia.

Description. Generally a deep brown, immaculate, or faintly marked species. *Male*: length of forewing 7.5–9.0 mm. Body scales, including those on vertex, antennal scape and flagellum, labial palpus, notum, and forewing nearly uniformly deep brown. Forewing

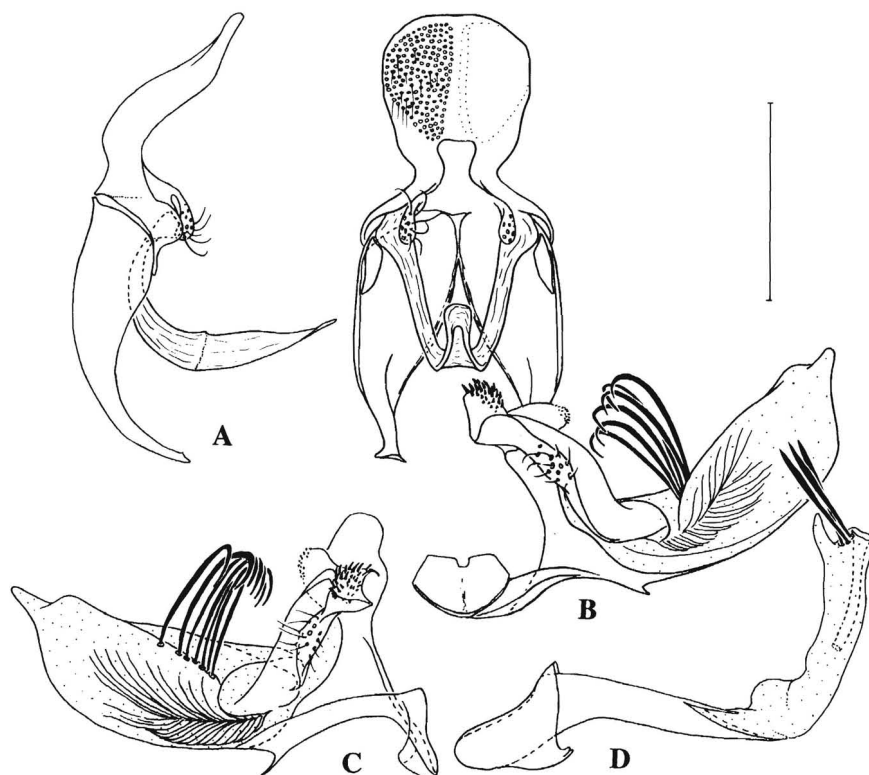


FIG. 2. Male genitalia of *Clepsip consimilana* (Hübner). A, lateral aspect of dorsal components of genitalia; B, posteroventral aspect of genitalia with left valva and aedeagus removed; C, mesal aspect of left valva; D, lateral aspect of aedeagus.

(Fig. 4B) slightly oblique terminally; costa straight with developed costal fold; immaculate, deep brown in most areas except for areas distad and posterad of anterior margin of discal cell with dominant dark grayish brown scales. Hindwing fairly uniformly dark grayish brown. *Female*: without costal fold, otherwise mostly similar to male.

Male genitalia (Figs. 2A–D): uncus well developed and sclerotized, depressed, distinctly bent at base, short and wide, gradually but distinctly broadened apically, 1.5 times, or less, as long as greatest width, with numerous fine setae on both ventral and dorsal surfaces except along medial areas; apex round. Socius small, mesally directed, with fusiform, well-sclerotized basal portion, and fleshy, short, thumb-shaped distal portion, as long as basal portion, with fine setae. Gnathos well developed and sclerotized, joined distomedially, forming wishbone-shaped structure with duck bill-shaped common medial process in posterodorsal view. Valva narrow, subrectangular, 2.5 times as long as width, with following diagnostic features: (a) small, fleshy, conical process at distal end; (b) row of conspicuously large, compressed, strongly curved, heavily sclerotized, mesally directed setae extending medially from base to about midlength of valva; and (c) basal process large, well developed and sclerotized, armlike, directed anteromesally, and reaching opposite counterpart medially; distal end of process hemispherical, with coarse, barblike spines dorsally; sacculus small, well sclerotized with small spinelike process ventrally. Aedeagus well scler-

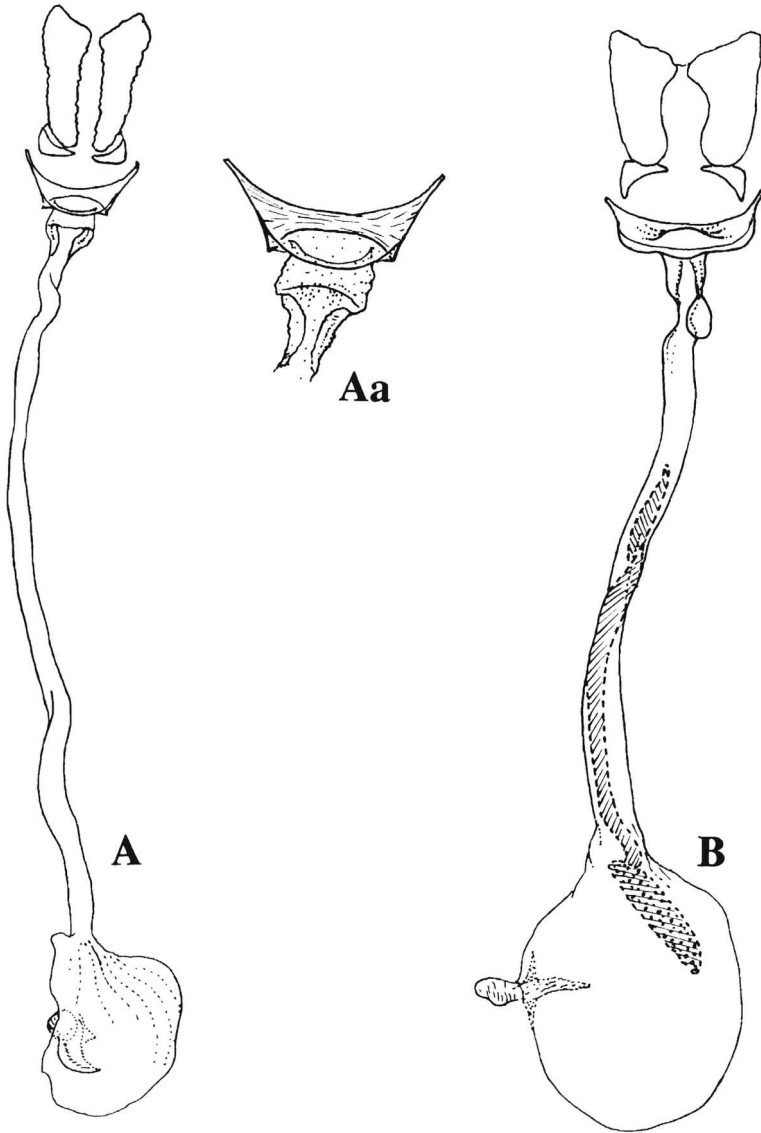


FIG. 3. Female genitalia. A, ventral aspect of genitalia of *C. spectrana*; Aa, sterigma region of *C. spectrana*; B, ventral aspect of genitalia of *C. consimilana*.

rotized, slender, fairly straight, wider anteriorly; dorsal one-third of aedeagus from apex produced apically into slender, spine-shaped, appressed process, nearly reaching apex; distal third obliquely tapered into sharp point apicoventrally. Vesica as long as aedeagus, fairly simple, cylindrical, with small finger-shaped, distodorsal diverticulum, and cluster of 3

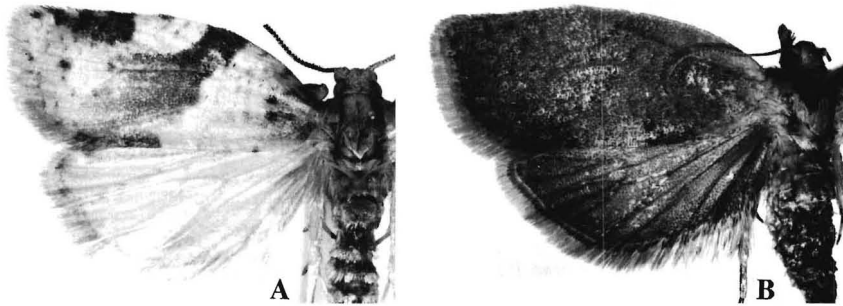


FIG. 4. Adults: A, *C. spectrana*; B, *C. consimilana*.

slender, large, seta-shaped, distally located cornuti; gonopore located just ventrad of cornutus cluster.

Female genitalia (Fig. 3B): Anal papillae short foot-shaped, with fine setae. Sterigma weakly sclerotized, trapezoidal, much wider posteriorly. Ostium bursae round. Antrum narrow anteriorly, mostly membranous, smooth. Ductus bursae anterad of antrum narrow, cylindrical, 4 times as long as anal papillae, membranous, with sclerotized ribbonlike plate, extending from posterior one-third from antrum to posterior portion of corpus bursae, ending in elongate oval plate with numerous round bumps covering inner surface. Corpus bursae small, spherical, membranous. Signum large, well sclerotized, compressed, claw-like with serrate inner edge, and with prominently protruded proximal end.

Remarks. There are two color forms, one with immaculate forewing and the other with faintly visible medial fascia.

Material Studied. CANADA: BRITISH COLUMBIA: Saanichton, 3.VI.1993, (reared from *Taxus baccata* L.), 4♀, 1♂ (1), R. Duncan; 24.VI.1994, (reared from *Taxus baccata* L.) 2♂ (1), 1♀ (1), R. Duncan. ENGLAND: Sydenham, VII.1892, 7♂ (2); Purbach, 2.VII.1899, 2♀ (1).

Biology. Larvae feed on privet and lilac (Europe and eastern United States). In British Columbia, the larvae were collected and reared from *Taxus baccata* L. (an unusual host) where they were found associated with *Argyrotaenia citrana* (Fernald) in large accumulations of webbing and chewed needle fragments; the flight period of the adults has not been fully recorded, but at least is known to occur throughout June.

ACKNOWLEDGMENTS

We thank Jim Troubridge of the Pacific Agriculture Research Centre, Vancouver, for excellent technical assistance; Bill Lukey, of the Biographic Division, Research Branch, Agriculture Canada, Ottawa, Ontario, for taking the photograph of adults; and John Huber and Henri Goulet of the Centre for Land and Biological Resources Research, Ottawa, Ontario, for reviewing the manuscript.

LITERATURE CITED

- BRADLEY, J. D., W. G. TREMEWAN, & A. SMITH. 1973. The Ray Soc., London. 251 pp.
 DANG, P. T. 1993. Vesica of selected tortricid and small Lepidoptera species, with descriptions of new techniques of vesica eversion (Lepidoptera: Tortricidae, Oecophoridae, Gelechiidae, and Nepticulidae). Can. Entomol. 125:785-799.
 KLOTS, A. B. 1941. Two European Tortricidae (Lepidoptera) not hitherto recorded from North America. Bull. Brooklyn Entomol. Soc. 36:126-127.
 KUZNETSOV, V. I. 1978. Family Tortricidae (Olethreutidae, Cochylidae) - tortricid moths, pp. 279-967. In Medvedev, G. S. (ed.), Keys to the insects of the European part of

- the USSR. Volume 4. Lepidoptera Part 1. Nauka Publ., Leningrad Div. (translated from Russian and published for the U. S. Dept. Agric., Amerind Publ. Co., New Delhi, 1987).
- POWELL, J. A. 1983. Tortricoidea, pp. 31–42. *In* Hodges, R. W., et al. (eds.), Check list of the Lepidoptera north of Mexico. E. W. Classey Ltd. and the Wedge Entomol. Research Foundation. London. 284 pp.
- . 1986. Occurrence of the palaearctic tortricid, *Clepsis consimilana* (Hübner), in Oregon. Pan Pacific Entomol. 62:165–166.
- RAZOWSKI, J. 1979. Revision of the genus *Clepsis* Guenée (Lepidoptera, Tortricidae). Part I. Act. Zool. Cracov. 23:101–198.

Received for publication 13 June 1995; revised and accepted 6 January 1996.