Epinotia palmqvisti sp.n. found in the Swedish mountains (Lepidoptera, Tortricidae)

HANS HELLBERG & BENGT Å. BENGTSSON

Hellberg, H. & Bengtsson, B.Å.: *Epinotia palmqvisti* sp.n. found in the Swedish mountains (Lepidoptera, Tortricidae). **[*Epinotia palmqvisti* sp.n. en ny vecklarfjäril från de svenska fjällen (Lepidoptera, Tortricidae).]** – Entomologisk Tidskrift 127(3): 105-110. Uppsala, Sweden 2016. ISSN 0013-886x.

A new species, *Epinotia palmqvisti* sp.n., in the family of Tortricidae is described and closely related species in the genus *Epinotia* are compared. The new species was bred from larvae found in August on *Betula pubescens* ssp. *czerepanovii* in the subalpine area of the Swedish province of Jämtland. One male and one female hatched in the spring next year. The species shows some similarity with *Epinotia tetraquetrana* (Haworth, 1811), which also feeds on *Betula*, but there are clear differences both in their external appearance and genitalia.

Hans Hellberg, Lofotengatan 16, S-164 33 Kista, Sweden; hhls@bahnhof.se
Bengt Å. Bengtsson, Lokegatan 3, S-386 93 Färjestaden, Sweden; bengt.a.bengtsson@gmail.com

The Lepidoptera fauna of Sweden is comparatively well known and new species are rarely discovered nowadays. Yet the northern parts may still hide unknown species, as vast areas are still not visited by lepidopterists. Even places where collectors have been before may harbour unknown species, and here we present such a case. In 1983 the first author (HH) collected some larvae on *Betula pubescens* ssp. *czerepanovii* (N.I. Orlova) at Undersåker in the province of Jämtland, which is in middle Sweden. Two specimens, one male and one female, emerged the following spring but their identity remained unknown for many years. The specimens were put aside as undetermined for a long time, pending an opportunity for identification. In 2015 the two specimens were presented to the second author who contacted several specialists of the Tortricidae, among them Leif Aarvik in Oslo, but nobody could associate them with a described species. The two specimens could not be matched with any known species, and therefore we describe them as a new species in this paper.

The tortricid genus *Epinotia* has 182 species worldwide (Brown 2005; http://www.tortricidae.com/catalogueSpeciesList.asp?gcode=368&chkLastInput=) and in Sweden 32 species have been recorded (Bengtsson et al. 2016). The species are in general middle-sized (wingspan 10–20 mm) and the forewing is usually brown with more or less distinct pattern in shape of strigulation and darker or paler spots and/or fasciae. The larvae of most species feed on the leaves of deciduous trees and shrubs or on conifers.

Methods and material

The illustrations of the genitalia were produced with a multilayer technique, using a Canon EOS 550D mounted on a compound microscope Euromex EB No. 149508 with a 10X objective. A Canon 100 mm macro lens on the same camera was used to take photos of the imagines with il-

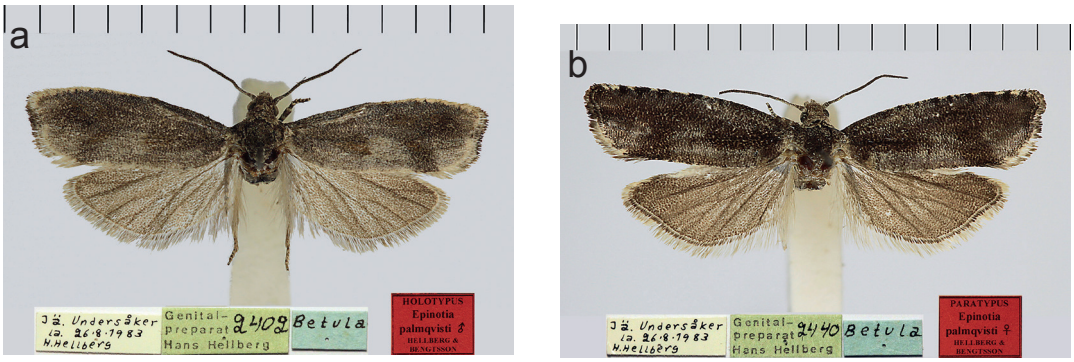

Figure 1. – a) Holotype (male) of *Epinotia palmqvisti* sp.n. – b) Paratype (female) of *Epinotia palmqvisti* sp.n.

Figure 2. – a) *Epinotia tetraquetrana* (Haworth, 1811), SUECIA, Öland, Ottenbylund, 16.VI.1977, leg. coll. B. Bengtsson. – b) ditto, SUECIA, Småland, Bäckebo, Millemåla, 16.V.1998. leg. coll. B Å Bengtsson.

lumination provided by a ring-shaped fluorescent tube. The software Helicon Focus Version 4.2.8 stacked the images, which were thereafter manipulated in Adobe Photoshop CS4 Version 11.0.2. All photographs are produced by the second author (BÅB).

***Epinotia palmqvisti* sp. n.**

Type locality: Sweden, Jämtland, Undersåker.

Type material: Holotype: ♂ – [SWEDEN] Jä[mtland], Undersåker, la. 26.8.1983, H. Hellberg; Genitalia slide 2402, Hans Hellberg; [host plant] *Betula*. – In coll. Natural History Museum, Stockholm.

Paratype: 1 ♀, same data as holotype, but genitalia slide 2440, Hans Hellberg. – In coll. Natural History Museum, Stockholm.

Diagnosis

Epinotia palmqvisti sp.n. is typified by its blurred forewing markings and this should separate the species from all other species in the genus *Epinotia* in Europe. Male (Fig. 1a) and female (Fig. 1b) show sexual dimorphism in having different forewing shapes.

E. palmqvisti resembles *E. tetraquetrana* (Haworth, 1811) (Fig. 2a & b; Razowski 2003) but the latter usually has more distinct markings. The male genitalia of *tetraquetrana* (Fig. 3b) differ from those in *palmqvisti* (Fig. 3a) for instance in having slender socii and convex cucullus in valva. The female genitalia of *tetraquetrana* (Fig. 4b) have a sterigma in the shape of a pair of isolated sclerites directed outwards. In *palmqvisti* (Fig. 4a) this structure appears to be

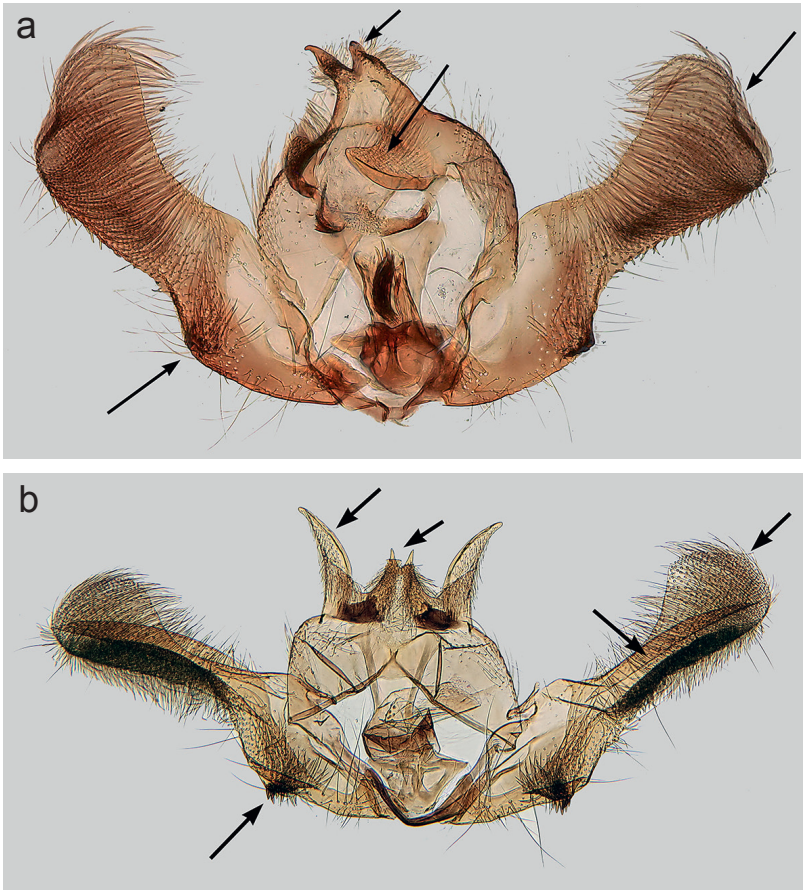

Figure 3. – a) Male genitalia of *Epinotia palmqvisti* sp.n. Holotype; slide Hans Hellberg 2402. – b) Male genitalia of *Epinotia tetraquetrana* (Hw.). SUECIA, Sm., Bäckebo, Grytsjön, 6.VI.2015, leg. coll. Bengt Å. Bengtsson. Slide BÅB 6515.

– a. Hangenitalier av *Epinotia palmqvisti* sp.n.. Holotyp; genitalpreparat Hans Hellberg 2402. – b. Hangenitalier av *Epinotia tetraquetrana* (Hw.). SUECIA, Sm., Bäckebo, Grytsjön, 6.VI.2015, leg. coll. Bengt Å. Bengtsson. Genitalpreparat BÅB 6515.

fused with tergum VII. *E. palmqvisti* has a slender colliculum whilst *tetraquetrana* has a broad and short colliculum. The wall of the corpus bursae in *palmqvisti* is densely covered by minute spines whereas in *tetraquetrana* the spines are much sparser.

E. cedricida Diakonoff, 1969, occurring indigenously in N Africa and SW Asia but introduced to S Europe, is also similar but the forewing markings are more distinct and the genitalia in both sexes are different (cf. Chambon 1999, Razowski 2003).

E. ramella (Linnaeus, 1758) has a quite different external appearance, having a black dorsal spot in the shape of a half crescent. The male genitalia have an appearance similar to that of *palmqvisti*, but the valva has a round cucullus (not concave as in *palmqvisti*) and the socii are slender and sickle-shaped (Razowski 2003). The shape of the subgenital sternite in segment VII separates the female genitalia of *palmqvisti* and *ramella*, the latter having a very shallow incurvation posteriorly.

E. rubricana Kuznetsov, 1968, occurring in the far east of Asia (Byun et al. 1998), also has similar genitalia, but the valvae have quite a different shape compared with those of *palmqvisti* and the ostium area differs in exhibiting a deeper cleft of the subgenital sternite and having a more sclerotized and elongated sterigma (Byun et al. 1998, Kuznetsov 2001). The external appearance of *rubricana* resembles *palmqvisti* as illustrated in Byun et al. (1998) in having the forewing with a curved costa but the fine, transverse strigulae are absent in the new species. However, the picture of an adult moth of *rubricana* on

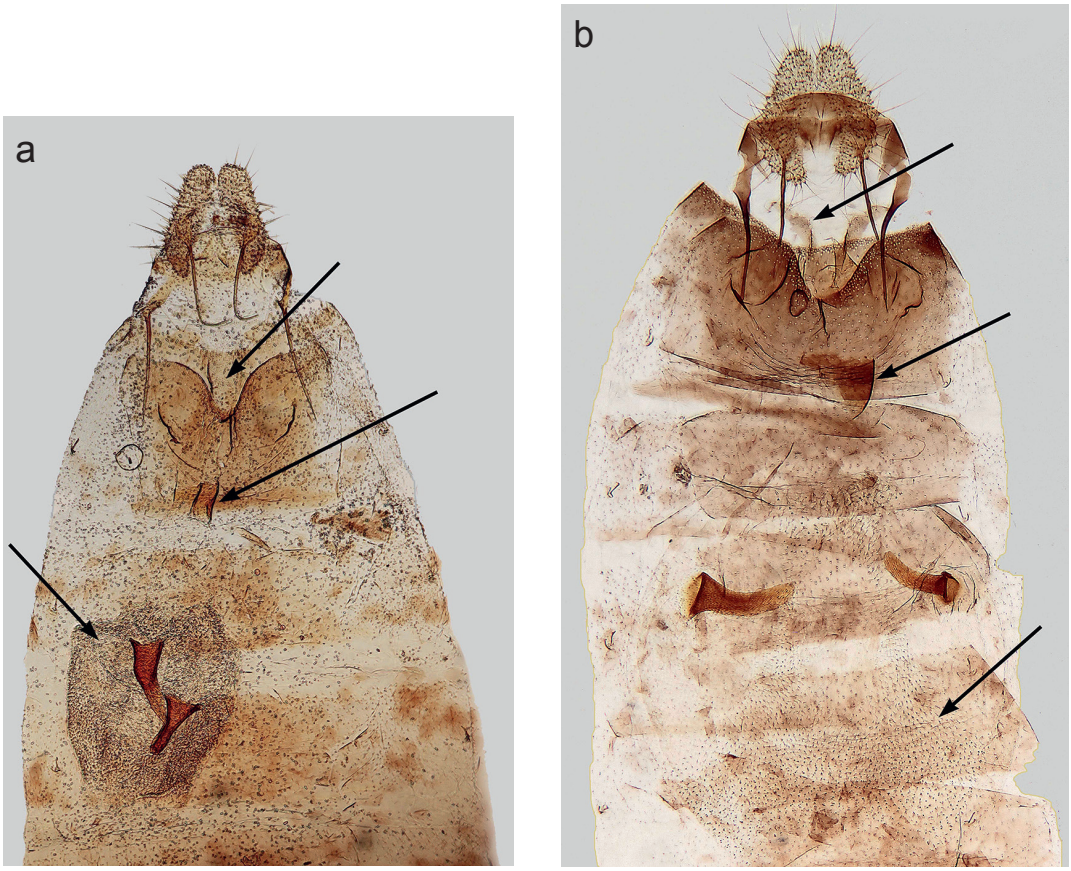

Figure 4. – a) Female genitalia of *Epinotia palmqvisti* sp.n. Paratype; slide Hans Hellberg 2440. – b) Female genitalia of *Epinotia tetraquetrana* (Hw.). [SUECIA] Öl., Löttorp, 12.VI.1977, leg. coll. Bengt Å. Bengtsson. Slide BÅB 595.

– a. Hongenitalier av *Epinotia palmqvisti* sp.n.. Paratyp; genitalpreparat Hans Hellberg 2440. – b. Hongenitalier av *Epinotia tetraquetrana* (Hw.). [SUECIA] Öl., Löttorp, 12.VI.1977, leg. coll. Bengt Å. Bengtsson. Genitalpreparat BÅB 595.

the website http://blog.goo.ne.jp/necydalis_major/e/23d24d74d711bb8a7c2e8d666a047198 differs significantly from *palmqvisti* sp.n.

Description

Male (Fig. 1a): Wingspan 13.5 mm. Head, tegulae, and thorax dark greyish brown with grey tips on each scale, face pale grey. Antennae dark brown, length approximately half of forewing. Labial palpus porrect, basal segment greyish; second segment broad, widening posteriorly, dark brownish, scales with paler tips; terminal segment very small, almost hidden within second. Maxillary palpus very small, pale greyish. Forewing with costal fold and curved costa; coloration various shades of brown, subtriangular blotch at dorsum and tornal spot greyish brown; fringes from costal fold and along termen cream-coloured, terminal fringes with grey tips. Hindwing plain greyish brown. Foreleg dark brownish, some whitish scales in middle of tibia; middle leg greyish brown with indistinct pale rings on posterior tip of tibia and tarsi; hindleg dirty beige.

Female (Fig. 1b): Wingspan 14 mm. Characters as in male but forewing narrower with an

almost straight costa, no costal fold, posterior two thirds of costa with white spots increasing in size posteriorly; terminal fringes with dark line at base and at tips of cilia.

Male genitalia (Fig. 2a): Uncus bifurcate. Socii subtriangular, rather short and broad, tips blunt, with reinforced, convex ventral margin. Gnathos a pair of bent sclerites united by a granular membrane. Phallus a short cylindrical structure with about half a dozen stouter cornuti and several narrower cornuti, all appressed together to form a dense 'brush' of seemingly inseparable parts. Juxta shield-shaped, trapezoid, widening posteriorly and with central, sclerotized ridge. Caulis (?) very large, twice as long as phallus, widening posteriorly. Valva slightly constricted in middle, sacculus with blunt extension furnished with setae and short spines; cucullus asymmetrically widened, covered with long setae, terminal margin slightly concave.

Female genitalia (Figs. 3a): Papillae anales membranous with short setae. Apophyses posteriores narrow, as long as papillae anales. Segment VIII weakly defined, apophyses anteriores also narrow and as long as apophyses posteriores. Ostium bursae located at sinus vaginalis (the deep, central incurvation of the genital plate). Sterigma (lamella postvaginalis) a weakly sclerotized, elongate plate with minute spines. Antrum with sclerotized colliculum, twice as long as broad. Ductus bursae membranous. Corpus bursae minutely wrinkled and spinose. Signa comparatively large, of different size, strongly sclerotized, long, stout, corniform with blunt tips.

Biology

The type locality is located in the subalpine region in the Scandinavian mountains c. 450 m.a.s.l. The dominant vegetation consists of mountain birch *Betula pubescens* ssp. *czerepanovii*. Larvae were collected from this plant on 26 August 1983 and produced one male and one female the following spring.

Distribution

Only known from the type locality: Sweden, Jämtland, Undersåker (63.3ºN 13.3ºE).

Etymology

The new species is dedicated to the Swedish entomologist Göran Palmqvist, Stockholm, who has contributed a considerable amount to the knowledge of the Lepidoptera fauna of Sweden over many decades.

Discussion

A possible reason why this species never has been encountered before might be that the adult moths emerge early in the spring (May) and are over before mid June, a period of the year when few collectors visit this part of Sweden. Out of the 37 species recorded from Europe, 10 species of *Epinotia* feed on Betula spp. (Razowski 2003). As most *Betula* species are abundant in the European area, competition between the larvae of different *Epinotia* species is very unlikely but hardly no study has been accomplished in this field. The larval host (*Betula*) indicates that this species might occur in other places in the subalpine region in Scandinavia and further to the east in Finland and Russia.

Acknowledgements

Our sincere thanks are due to Leif Aarvik, The Natural History Museum in Oslo, who contributed interesting discussions and informed us about important literature, and to Robert J. Heckford, Plympton, UK for checking the English.

References

Bengtsson, B.Å., Gustafsson, B. & Palmqvist, G. 2016. Katalog över svenska fjärilar. Catalogue of Swedish Lepidoptera. – The Entomological Society, Stockholm & The Swedish Museum of Natural History.

Brown, J.W. 2005. World Catalogue of Insects. Volume 5. Tortricidae (Lepidoptera). – Apollo Books. Stenstrup.

Byuin, B.K., Bae, Y.S. & Park, K.T. 1998. Illustrated Catalogue of Tortricidae in Korea (Lepidoptera). – In: Park, K. T. (ed.). Insects of Korea [2], pp. 317.

Chambon, J.-P. 1999. Atlas des Genitalia Mâles des Lépidoptères Tortricidae de France et Belgique. – Paris.

Kuznetsov, V.I. 2001. Tortricoidae. – In P. A. Ler (ed.). Key to the insects of Russian Far East. Vol. V. Trichoptera and Lepidoptera. Pt. 3: 1-621. Valdivostok, Dal'nauka.

Razowski, J. 2003. Tortricidae (Lepidoptera) of Europe. Volume 2. Olethreutinae. – Bratislava.

Sammanfattning

Den 23 augusti 1983 samlade den förste författaren (HH) in larver på fjällbjörk *Betula pubescens* ssp. *czerepanovii* (N. I. Orlova) i Jämtland vid Undersåker. Efter övervintring kläcktes en hane och en hona. De kunde inte omedelbart bestämmas till art utan blev satta åt sidan för att studeras senare. Litteraturen gav inga ledtrådar utom att fjärilarna borde tillhöra vecklarsläktet *Epinotia*. Under ett möte på Öland 2015 fick den andre författaren (BÅB) erbjudande att försöka hitta ett namn på vecklarna genom kontakter med specialister på denna grupp. Individerna kunde inte bestämmas till någon tidigare känd art, utan beskrivs som en ny art i denna upp-sats.

Den nya arten, *Epinotia palmqvisti*, har en tydlig könsdimorfism genom olika vingform mellan hane (Fig. 1a) och hona (Fig. 1b). Framvingen hos hanen har en tydligt böjd framkant med ett costalveck och fransarna är enfärgat gräddgula. Hos honan är framkanten nästan rak och framkantsfransarna är fläckiga. I genitalierna är formen på genitalklaffarna typisk och skiljer sig från alla andra kända arter inom Palearktikum. Även honan har mycket karaktäristiska genitalier, där inbuktningen (sinus vaginalis) hos subgenitalplattan har ett djup som knappast ingen annan art inom *Epinotia* har.

I första hand liknar *E. palmqvisti* den mycket vanliga *E. tetraquetrana* björkgallvecklare (Fig. 2a och b), men teckningarna i framvingen är otydligare och utan tvärstrimmor. I genitalierna finns framför allt skillnader hos hanarna. Genitalklaffarna hos *tetraquetrana* (Fig. 3b) är smalare och har en annan profil och socii är smala och långa. Hos honan (Fig. 4b) är den sklerotiserade kragen (colliculum) i ductus bursae bredare och kortare än hos *palmqvisti* (Fig. 4a).

Vecklarspecialisten Leif Aarvik vid museet i Oslo pekade på likheterna med *Epinotia rubricana* Kuzn. från Ostasien, men både utvändigt och i genitalierna är skillnaderna stora (Byun et al. 1998). Genitalmorfologiskt står *palmqvisti* ganska nära *E. ramella* (L.), men utvändigt är dessa båda arter mycket olika (Razowski 2003).

Med tanke på hur denna art hittades kan man förmoda att den flyger relativt tidigt på säsongen, vilket i så fall skulle förklara varför ingen har träffat på den tidigare. Möjligen har fjärilarna flugit över redan före midsommar, som brukar vara den tidpunkt då de flesta samlare anträder sin resa norrut till de svenska fjällen.