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Discovery of the Tribe Polyorthini Obraztsov, 1966 in the Canary Islands. Description of the genus *Canaria* Larsen, gen. n. and the species *C. palmariana* Larsen, sp. n. and *C. gomeriana* Larsen, sp. n. (Lepidoptera: Tortricidae, Chlidanotinae, Polyorthini)

K. Larsen

Abstract

A new genus of the tribe Polyorthini *Canaria* Larsen, gen. n. and two new species *Canaria palmariana* Larsen, sp. n. and *Canaria gomeriana* Larsen, sp. n. are described from the Canary Islands respectively from La Palma and La Gomera. The genus *Canaria* differs from the closest related genus *Lopharcha* Diakonoff, 1941 by external characters and by both male and female genitalia. The two new species differs in external characters and structure of labial palpi, abdomen, legs and wings plus in DNA. Photographs of adults, palpi, genitalia and type localities are provided.
KEY WORDS: Lepidoptera, Tortricidae, Polyorthini, *Canaria*, *Canaria palmariana, Canaria gomeriana*, Canary Islands, Spain.

Descubrimiento de la tribu Polyorthini Obraztsov, 1966 en las Islas Canarias. Descripción del género *Canaria* Larsen, gen. n. y las especies *C. palmariana* Larsen, sp. n. y *C. gomeriana* Larsen, sp. n. (Lepidoptera: Tortricidae, Chlidanotinae, Polyorthini)

Resumen

Se describe de las Islas Canarias un nuevo género de la tribu Polyorthini *Canaria* Larsen, gen. n. y dos nuevas especies *Canaria palmariana* Larsen, sp. n. and *Canaria gomeriana* Larsen, sp. n. respectivamente de La Palma y La Gomera. El género *Canaria* difiere del relativamente del género próximo *Lopharcha* Diakonoff, 1941, por los caracteres externos y por la genitalia de ambos macho y hembra. Las dos nuevas especies difieren en los caracteres externos y la estructura del palpo labial, abdomen, patas y venas más en ADN. Se proporcionan fotografías de los adultos, palpos, genitalia y localidades tipo.
PALABRAS CLAVE: Lepidoptera, Tortricidae, Polyorthini, *Canaria*, *Canaria palmariana, Canaria gomeriana*, Islas Canarias, España.

Introduction

The subtribe Polyorthini is mainly distributed in South America, South East Asia and Australia. A few genera are known from the old world. (GILLIGAN *et al*., 2014). It was a big surprise to discover a new genus and two new species of Polyorthini from La Gomera and La Palma in the Canary Islands (Spain). The nearest relatives to the new genus are found in Nepal and Vietnam. (NEDOSHIVINA, 2013; RAZOWSKI, 1992). There are only two genera of Polyorthini in Europe *Isotrias* Meyrick, 1885 (nine

species) and *Olindia* Guenée, 1845 (one species); likewise in Africa: *Ebodina* Diakonoff, 1968 (two species) and *Xenoboda* Razowski & Tuck, 2000 (three species). (RAZOWSKI, 2002, 2017). None of the European and African genera are close relatives to the new genus.

The general appearance of many species in this group are rather similar to *Acleris* (subfamily Tortricinae, tribe Tortricini), and they were treated like this by Meyrick (CLARKE, 1958), but transferred to Polyorthini by DIAKONOFF (1974).

Imagines of the two new species are easy to recognize by appearance and they are separated from all other species in Polyorthini by special structures in the wings and in the genitalia. The possible long term isolation of the genus in the Canary Islands may also have affected the separation of the genus from any other genus in the subfamily.

Material and methods

The specimens were collected during a joint Danish expedition in August 2018 to Tenerife, La Palma, El Hierro and La Gomera. The specimens were found in La Palma and La Gomera using light traps with eight watt super actinic tubes and 125 watt mercury vapur bulbs.

The genitalia slides are made according to standard procedure mounted in euparal. The photographs of genitalia are taken by a Toup Tek camera mounted on a Toup Tek binocular microscope.

The holotypes are deposited in the collection A. Vives / Museo Nacional de Ciencias Naturales, Madrid, Spain.

The nomenclature for imagines and genitalia follow HORAK (1991) and RAZOWSKI (2008).

Canaria Larsen, gen. n.

Type species: *Canaria palmariana* Larsen, 2020.

Diagnosis: *Canaria* is characterized by the rather narrow, elongate and pointed forewing. There is a transverse band one third from the base including some blotches of raised scale tufts. The biggest is close to dorsum. On the underside, basally and close to dorsum, there is a blotch of stronger scales. Hindwings are also pointed with concave termen. At the base there is a tuft of long very fine hairy scales bend towards the dorsum, a cubital pecten.

These diagnostic characters are present in both species and both genders.

The female genitalia are characterized by a very long and fragile ductus bursa. Bursa itself has a pattern of small straight spines filling the complete corpus bursa. There is a very large bulla seminalis.

The male is not known.

The genus *Canaria* is closely related to *Lopharcha* Diakonoff, 1941. In *Lopharcha* al species except one have one or two signa in bursa. None of the species have a cubital pecten on the hind wing and none are described with the blotch of stronger scales on the base of the underside of the forewing (DIAKONOFF, 1974; RAZOWSKI, 1976, 2017).

Differences in the male genitalia will be discussed under the description of *Canaria gomeriana* Larsen, sp. n.

The genus *Lopharcha* consists of 23 species distributed from Nepal, Vietnam, Indonesia, Papua New Guinea over Australia to New Caledonia and with one representative in Japan. (GILLEGAN *et al*., 2014). The distance to the nearest known *Lopharcha* Diakonoff, 1941 population in Nepal from the Canary Islands is nearly 10.000 km.

Etymology: The name *Canaria* is chosen because of the geographically isolated presence in the Canary Islands, Spain.

Canaria palmariana Larsen, sp. n. (Figs 1-2)

Material examined: Holotype ♀, SPAIN: Canary Islands, La Palma, Barranco de la Madera, 500 m, 14-15-VIII-2018, K. Larsen leg., gen. prep. 3506 ♀ K. Larsen.

Description: Male. Unknown.

Female (Fig. 1): Wingspan: 14 mm. Frons upper part light creamy lower part grey. Vertex is light creamy. Ocellus posterior. Antenna less than half the length of the forewing, white ringed the complete length. Labial palpus (Fig. 2) moderate triangular shaped, terminal segment rather short, black ringed. Colour of labial palpus divided, upper part grey, lower part creamy whitish widening posteriorly. Thorax and tegulae dark brown. Abdomen blackish brown except the second last segment which is greyish white interrupted in the middle by a dark brown line. Legs creamy light yellow with long spurs.

Forewing lanceolate curved, apex pointed. Termen very moderate indented and oblique. Ground colour is blackish brown with lighter ochreous parts forming an oblique median fascia. Two thirds from costa there is a bigger scale tuft, which is light grey and placed in a round indented part of the wing. Cilia dark brown with a light dividing line. Hindwing light grey, gradually darker and browner towards pointed apex; termen strongly concave. Venation darker scaled. Cilia longer than cilia at the forewing, and with the same colour as wing and with light basal line. Dorsal part unto the termen with scattered black scales. Base of wing with large cubital pecten consisting of long hairy scales curved upright.

Underside of forewings grey with light costal strigula. At base a small indented part with short whitish, raised scalesh. Underside of hindwing peculiar, divided in three light grey areas stretching from base of the wing to the termen separated with three brown lines following the venation. The same darker lines visible on the upper side.

Female genitalia (Fig. 6): Sterigma cup-shaped with strongly curved lateral lobes. Antrum broader than ductus bursa which is very long, narrow, but widening a bit one third of the length. Ductus bursa fragile and weekly sclerotized, widening again just before corpus bursa, covered by a large amount of small spines spread over bursa in an equal pattern. Bulla seminalis very large.

It is to be noticed that the apophyses in the left side of the preparation is somewhat distorted. The specimen was born with this deformation.

Preparate of abdomen is shown in figure 7. The segments are characterized by the strong sclerotized framing.

Biology: Not known except the collecting date and the locality (Fig. 8). The type locality is Barranco de la Madera. This barranco is very narrow and steep. The vegetation is partly dry *Pinus* forest and partly Laurisilva forest, which continues to the northern part of La Palma.

Etymology: The species name *palmariana* refers to the finding in La Palma.

Canaria gomeriana **Larsen, sp. n.** (Figs 3-4)

Material examined: Holotype ♂, SPAIN: Canary Islands, La Gomera, El Cedro, 870 m, 17-20-VIII-2018, K. Larsen leg., gen. prep. 3507 ♂ K. Larsen.

Description: Male (Fig. 3). Wingspan: 11 mm. Frons and vertex deep chocolate brown all over. Ocellus posterior. Antenna one third of the length of the forewing very weakly ciliate. Last two thirds of the antenna weakly whitish ringed. Labial palpus (Fig. 4) short with a short terminal segment. Colour dark brown, laterally a little lighter. Thorax, tegulae and abdomen dark brown. Legs dark brown.

Forewing lanceolate curved with pointed apex. Termen moderate indented and oblique. Ground dark chocolate brown. The oblique median fascia marked with black lines inwardly as a double line melting together just before dorsum. Space between the lines filled out with dark ochreous scales looking like a stretched drop on the wing. On the last third of the wing some very inconspicuous reddish brown cross lines. In the centre of the wing the scales have a weak bluish tinge and there is a very tiny patch of raised scales. Cilia of the same colour as the wing.

Hindwing with pointed apex; termen oblique and strongly concave. Colour dark brown. Cilia a little lighter than the colour of the wing. Base of wing with a large cubital pecten consisting of long hairy scales curved upright.

Underside of the forewings dark brown with a lighter patch along the last half of costa and at apex. At the base there is a little patch of raised scales of the same colour as the wing. Underside of the hindwings of same colour as the forewings. The venation is weakly marked with scales slightly darker than the dark ground colour.

Male genitalia (Fig. 5): According to DIAKONOFF (1974) the male genitalia are very delicate to mount. Tegumen and the sinuous vinculum are on top of each other and also combined with the strong sclerotized eight segment of abdomen. Valva are thin-walled membranous in more layers and thus not with a specific clear form when mounted. In the present case the tegumen with uncus has been bent downwards under the preparation process not to cover the other structures.
Tegumen slender, pedunculus broad, uncus strongly bent, long and rather thin but a little thickened in the middle. Socius broad, oval covered with small spines. Gnathos is long and slender, strongly sclerotized (can be seen in between the two large socius). Phallus long with minor folds at the tip and placed straight upright in the middle of the structure. Vesica large. Valva membranous with at least two layers depending on where the layers are counted. Thus they cannot be spread out, but even then it is easy to see the general structure covered with many smaller and longer hairs especially at costa, dorsum and apex. Valva pointed and somewhat inconspicuously eggshaped. The strong curved structure of the eigth segment is also seen. Female is not known.

Biology: Not known except the collecting date and the locality (Fig. 9). The type locality is a terraced fruit garden at the edge of the large Laurisilva forest in the centre of La Gomera.

Etymology: The species name *gomeriana* refers to the finding on La Gomera.

Diagnosis: *C. gomeriana* is related to *C. palmariana* differing by strong external characters both on abdomen, frons and wings. *C. gomeriana* is much smaller, fewer drawings on the wing and frons and labial palpi are unicoloruos dark brown. Both the color of the hindwing and the drawings on the underside of the hindwing are different, as *C. palmariana* has three large whitish areas separated by darker veins. The tuft at the base of the underside of the forewing is light brown in opposition to a large whitish tuft with much longer scales than at the other species. The terminal part of labial palps is smaller in *C. gomeriana.* Legs are brown not light yellowish and have shorter tibia spurs. The large tuft with raised scales is replaced with a small hardly visible tuft, plain with the surface of the wing in *C. gomeriana*. The complete structure of *C. gomeriana* demonstrates in all parts that the two specimens belong to two different species in the same genus.

Results from the DNA analysis from Guelph, Canada in BOLD systems shows a difference on 4.4 % between the two species. Distance model: kimura 2 parameter. Marker: COI-5P. Results at a high quality level.

The male genitalia of *C. gomeriana* differs from the type of the genus *Lopharcha* Diakonoff, 1941 by the strongly sclerotized and curved vinculum, the very large phallus without cornuti and the lack of a large coremata tuft on the eight sternite and the lack of the large anellus plate found in the type species of *Lopharcha* Diakonoff, 1941.

Overall the female genitalia in Polyorthini are much less subject to polymorphy and variation than those of the males (DIAKONOFF, 1974).

Discussion

In 2013 I described a new genus *Willibaldiana* Larsen, 2013 (LARSEN, 2013) consisting of two new species found at the same locality in Jandia, Fuerteventura. This genus was placed in Eucosmini, but with uncertain position because of the very unusual structure of the genitalia. A recent DNA analysis shows less difference in the DNA than concerns the two present species. This is a very valid argument for the understanding of the character of the two specimens male and female found in La Gomera and La Palma as different species, although they belong to different gender. Besides there are very large dissimilarities in the imagines as described above. The finding of the new genus on two Islands demonstrates that it presumably cannot be an accidental introduction of species from a distant country. Like the two new species from Fuerteventura, it is to

be believed that these species are difficult to find and probably can be very local as many Tortricidae species can be. It is to be remarked that the nearest relative is to be found in Nepal about 10.000 km. away.

Polyorthini is the oldest subtribe of Tortricidae going back to the late cretaceous period, an estimated 70 million years ago (FAGUA *et al*., 2016), but the age of La Palma is estimated 1.7 ma old and La Gomera 11 ma (BOGAARD, 2013). A tentative idea could be, that the new genus has survived the different ice ages which also is the case of several genera of plants because of the southern isolated position of the islands. After the drying out of North Africa creating the Sahara, the Laurisilva forest ecosystem has been isolated for thousands of years. (BRAMWELL & BRAMWELL, 2001) The new genus could be a very old relict connected with the occurrence of the Laurisilva forest.

Further investigation on these species will be carried out and published together with new information on the genus *Willibaldiana*.

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K. L.
Røntoftevej, 33
DK-2870 Dyssegaard
DINAMARCA / *DENMARK*
E-mail: knud.torts@gmail.com
https://orcid.org/0000-0001-5556-3503

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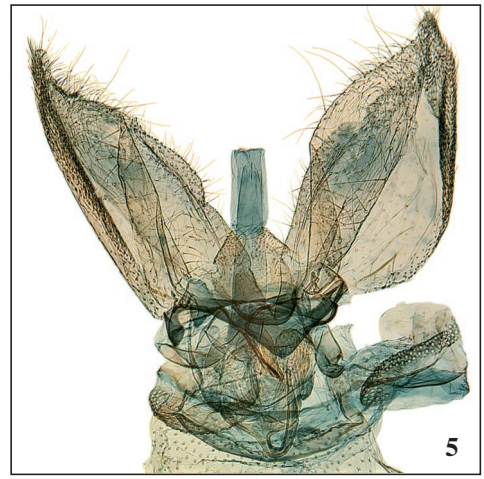
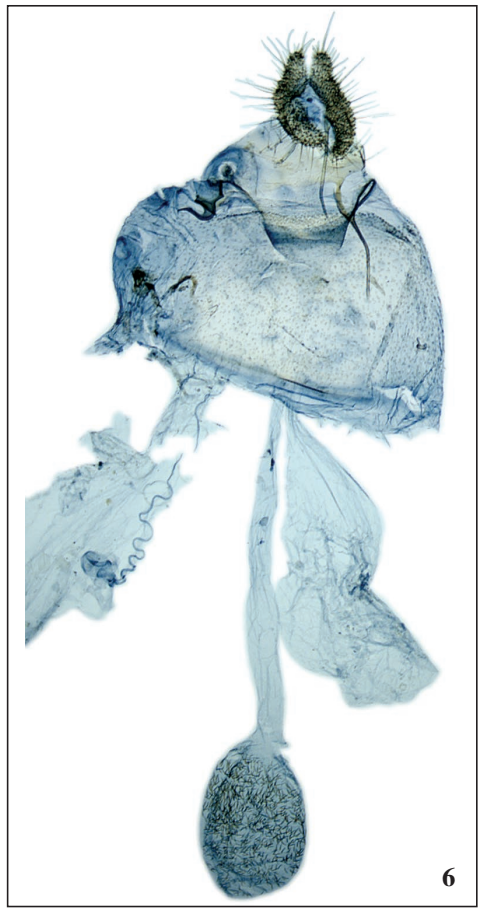


Figures 1-5.– 1. *Canaria palmariana* Larsen, sp. n. Holotype ♀. **2.** Labial palpus. **3.** *Canaria gomeriana* Larsen, sp. n. Holotype ♂. **4.** Labial palpus. **5.** *C. gomeriana* Larsen, sp. n. male genitalia Holotype. Gen. prep. 3507 ♂ K. Larsen.



Figures 6-9.– 6. *C. palmariana* Larsen, sp. n. female genitalia Holotype. Gen. prep. 3506 ♀ K. Larsen. **7.** *C. palmariana* Larsen, sp. n. abdomen prep. 3506 ♀ K. Larsen. **8.** La Palma, Barranco de la Madera. Type locality for *C. palmariana* Larsen, sp. n. **9.** La Gomera, El Cedro. Type locality for *C. gomeriana* Larsen, sp. n.