

# ***Cosmopterix athesiae* sp. n., a widespread new species from Europe and Africa (Lepidoptera: Cosmopterigidae, Cosmopteriginae)**

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***Cosmopterix athesiae* sp. n., eine weit verbreitete neue Art aus Europa und Afrika (Lepidoptera: Cosmopterigidae, Cosmopteriginae)**

## **Abstract**

A new species of Lepidoptera, viz. *Cosmopterix athesiae* sp. n., is described and the adult as well as male and female genitalia are figured and compared with the most closely related species. The species seems to be widespread in the Mediterranean and records include Italy, Spain, Greece and furthermore Tanzania and Cameroon.

## **Zusammenfassung**

Eine neue Schmetterlingsart, viz. *Cosmopterix athesiae* sp. n., wird beschrieben und Imago sowie männliche und weibliche Genitalstrukturen werden abgebildet und mit den nächstverwandten Arten verglichen. Die Art dürfte im Mittelmeerraum weit verbreitet sein und Nachweise sind aus Italien, Spanien und Griechenland sowie weiters aus Tansania und Kamerun bekannt.

**Keywords:** *Cosmopterix athesiae*, new species, Lepidoptera, Cosmopterigidae, Europe, Africa

## **Introduction**

During the preparation of volume 5 of Microlepidoptera of Europe (KOSTER & SINEV 2003) many specimens of the families Momphidae, Batrachedridae, Stathmopodidae, Agonoxenidae and Cosmopterigidae have been examined. Amongst this were many specimens of the genus *Cosmopterix* HÜBNER, [1825], including an unknown female from Greece. Unfortunately the specimen had lost its abdomen, and a proper determination was not possible. No additional material has showed up at that time and this was the reason that this species was not included in volume 5 of ME. According to its similarity with *Cosmopterix ingeniosa* MEYRICK, 1909, Sergey Sinev has provisionally determined the specimen as *Cosmopterix* near *ingeniosa* by the external characters.

During a recent check of the collections of Tiroler Landesmuseum Ferdinandeum a further female specimen of this questionable species collected by Burmann in northern Italy and misidentified as *Cosmopterix coryphaea* WALSINGHAM, 1908 was found.

An extensive study of literature showed that this doubtful species of *Cosmopterix* was already known to several former authors and repeatedly suspected as new species. The first hints date back to REBEL (1899) who described in detail a single, probably male specimen collected on 14.vii.1898 near Bozen (South Tyrol, Italy) by Hedemann. Due to the lack of material it was attributed to *Cosmopterix scribaiella* ZELLER, 1850 with doubts. The same specimen was later acquired by Aristide Caradja who again published it under the name *Cosmopterix ?scribaiella* however, taking it for a different species (CARADJA 1920). During a more recent examination it was identified as *Cosmopterix donatellae* MARIANI, 1932 (currently a synonym of *Cosmopterix coryphaea* WALSINGHAM, 1908) by RIEDL & POPESCU-GORJ (1974). The specimen is still represented in the Caradja-collection now deposited in MINGA (Bucha-

rest, Romania). Due to the courtesy of Mihai Stanescu we have studied a photograph which, despite of the lost abdomen of the specimen, clearly proves the conspecificity with *Cosmopterix athesiae* sp. n.

A further male specimen most probably representing *Cosmopterix athesiae* sp. n. was collected on 29.vii.1941 in the surroundings of San Vigilio (Verona, Italy) by Hartig and together with the above mentioned specimen from Bozen it was published under the name *Cosmopterix donatellae* (HARTIG 1964). However, HARTIG (op. cit.) himself suspected that his specimen together with the one from Bozen probably belongs to a new species. The specimen from San Vigilio mentioned by BURMANN & HUEMER (1998) as *Cosmopterix donatella* [sic] refers to Hartig. Unfortunately the material of the Hartig-collection in Rome was not accessible during our study (Zilli, in litt.) but it is most likely that it also belongs to *Cosmopterix athesiae* sp. n.

During the preparation stage of our paper we have been able to examine several additional specimens, originating from Spain, Tanzania and Cameroon. The state of the suspected new species was finally checked with the most recent literature and the examination of types of *Cosmopterix ingeniosa* MEYRICK, 1909.

## Abbreviations

ME – Microlepidoptera of Europe

MINGA – Muzeul National de Istorie Naturala “Grigore Antipa”, Bucharest, Romania

RMNH – National Museum of Natural History Naturalis, Leiden, The Netherlands

RMCA – Royal Museum for Central Africa, Tervuren, Belgium

TLMF – Tiroler Landesmuseum Ferdinandeum, Innsbruck, Austria

## Results

### *Cosmopterix athesiae* sp. n.

Material. Holotype ♀: Italia, L[ago] d[i] Garda, M[on]te Maderno, 250 m, 4–7.vii.[19]64, leg. K. Burmann; genitalia slide JCK 5970 (TLMF) [here designated].

Paratypes: 1 ♂ [?, without abdomen, examined by M. Stanescu]: Italy: South Tyrol, Bozen, Hirtenberg, 14.vii.1898, leg. Hedemann (MINGA). 1 ♀: Spain: Castellon, Sierra d'Espadan, SE Almedijar, Mosquera, 600 m, 30° 52.56' N, 00° 22.94' W, 9.ix.2005, leg. Huemer (TLMF). 1 ♀: Greece, Peloponnisos, gorge, 12 km SE of Kardhamili, 29.vi.1991, leg. R.T.A. Schouten (RMNH).? 1 ♂: Cameroon, North Province, Faro riverside 289 m, 08° 23' N 012° 49' E, 24.xi.2003, leg. J. De Prins, genitalia slide JCK 5976. 1 ♂: Cameroon, North Province, Faro riverside 289 m, 08° 23' N 012° 49' E, 25.xi.2003, leg. J. De Prins. 2 ♂: Cameroon, North Province, Faro riverside 289 m, 08° 23' N 012° 49' E, 27.xi.2003, leg. J. De Prins. 1 ♂: Cameroon, North Province, Faro riverside 289 m, 08° 22' N 012° 51' E, 1.xii.2003, leg. J. De Prins. 5 ♂: Cameroon, North Province, Faro River Camp, 275 m, 08° 25' N 012° 49' E, 1-9.v.2005, leg. J. & W. De Prins (RMCA). 1 ♂: Tanzania, Morogoro Distr. & Town, 550-600 m, 18.iii.1992, leg. L. Aarvik (coll. Aarvik). 1 ♀: Cameroon, North Province, Faro riverside 289 m, 08° 23' N 012° 49' E, 27.xi.2003, leg. J. de Prins; genitalia slide JCK 5972. 2 ♀: Cameroon, North Province, Faro riverside 289 m, 08° 23' N 012° 49' E, 28.xi.2003, leg. J. de Prins. 1 ♀: Cameroon, North Province, Faro riverside 289 m, 08° 22' N 012° 51' E, 29.xi.2003, leg. J. de Prins; genitalia slide JCK 5971. 1 ♀: Cameroon, North Province, Faro riverside 289 m, 08° 22' N 012° 51' E, 30.xi.2003, leg. J. De Prins. 2 ♀: Cameroon, North Province, Faro River Camp, 275 m, 08° 25' N 012° 49' E, 1-9.v.2005, leg. J. & W. De Prins (RMCA). 1 ♀: Tanzania, Morogoro Distr. & Town, 550-600 m, 5.iv.1992, leg. L. Aarvik; genitalia slide JCK 5975 (coll. Aarvik).

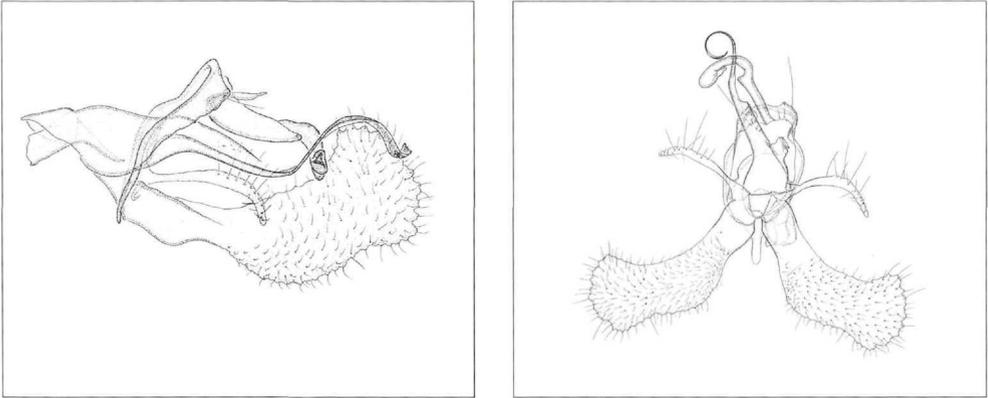
**D e r i v a t i o n o m i n i s.** The specific name refers to the river Etsch (in Italian Adige), named Athesis by the Romans. The drainage area of this river covers the first collecting localities.



Fig. 1: *Cosmopterix athesiae* sp. n., adult (watercolour by S. Koster)

**D i a g n o s i s.** The double white line on the tegulae of the adult, in combination with the long distal protrusion on the aedeagus and the paddle-shaped valvae in the male genitalia or with the almost complete sclerotization of the ductus bursae in the female genitalia are characteristic.

**D e s c r i p t i o n o f i m a g o** (Fig. 1). Male and female. Forewing length 4.3–4.7 mm. Head: frons shining white with greenish and reddish reflections; vertex brown with reddish gloss, neck tufts dark brown with reddish gloss, laterally and medially lined white, collar shining dark brown with reddish gloss; labial palpus first segment very short, white, second segment three-fourths length of third segment, greyish brown with white longitudinal lines laterally and ventrally, third segment white, dark brown lined laterally; scape dorsally dark brown with white anterior and posterior lines, ventrally white, antenna shining dark greyish brown, with a white line from base changing into an interrupted line to about one-half, an indistinct whitish segment at three-fourths, before apex about seven segments pale grey and three dark greyish brown segments at apex. Thorax and tegulae shining dark brown with reddish gloss, thorax with a white medial line, tegulae lined white in- and outwardly. Legs: shining dark greyish brown with reddish gloss, femura of mid and hindleg shining ochreous-white, more greyish towards apex, fo-



Figs. 2–3: *Cosmopterix athesiae* sp. n., male genitalia (dorsoventral and lateral view) (line drawing by S. Koster)

releg with white longitudinal line on tibia and tarsal segments one to three and five, tibia midleg with white oblique basal and medial lines and white apical ring, tarsal segment one with whitish lateral line on outside and bending dorsally at apex, segments two, three and five dorsally white, tibia hindleg as midleg but with an additional broad white subapical line, tarsal segment one dorsally white as base and in apical half, other segments dorsally white, spurs white dorsally, ochreous-white ventrally. Forewing shining dark brown with reddish gloss, three broad white lines basal area, a subcostal from base to one-fourth, bending inwardly in distal half, a medial above fold from near base to yellow fascia, a similar subdorsal below fold, at dorsum a short and indistinct white edging beyond base, a broad yellow fascia beyond middle, outwardly extending towards apex, bordered at inner edge by a tubercular silver to pale golden metallic subcostal and subdorsal spot, the subdorsal slightly further from base, the subcostal outwardly edged by blackish scales, at three-fourths of yellow fascia similar spots at costa and dorsum, dorsal twice as large as costal and with some brownish edging inwardly at dorsum, a broad white streak from costal spot into cilia, a broad white apex line from yellow fascia into termen but not reaching apex, cilia dark greyish brown, paler towards dorsum. Hindwing shining pale grey to brownish grey with some reddish and greenish gloss, cilia pale greyish brown. Underside forewing shining pale greyish brown, white apex line distinctly visible, hindwing shining pale brownish grey. Abdomen greyish ochreous dorsally, segments narrowly grey banded posteriorly, ventrally shining white, anal tuft shining white. In female the anal tuft has a blackish spot on both lateral sides.

**V a r i a t i o n.** Sometimes the antennae are almost completely dark brownish grey without whites or pale grey segments, the two lines on the tegulae sometimes meet posteriorly, the width of the yellow fascia on the forewing varies from one-fourth of length of forewing (holotype) to one-third of this length (specimen from Greece).

**M a l e g e n i t a l i a** (Figs. 2–3). Right brachium of uncus long and partially narrow, beyond one-half with a semi-circular loop to the left, apical part bending to the right in a large hook, left brachium very short and slender, tip pointed. Tegumen very narrow. Valvae paddle-shaped, apical third widening, caudal margin crenellate, upper margin slightly concave and lower margin convex. Anellus lobes very narrow, gradually bend, apex rounded. Aedeagus [phallus *sensu* KRISTENSEN (1984)] bottle-shaped, narrowing distally to less than one-third of bulbous part with a very long and curled protrusion, total length of it about the length of the bulbous part, basal part short, about one-fourth of length of bulbous part, laterally slaps large, triangular, almost as long as basal part.

**F e m a l e g e n i t a l i a** (Fig. 4). Posterior edge of sternite VII straight. Sterigma (Fig. 5) strongly sclerotized, about four times as long as wide, ostium bursae angular with thick walls. Ductus bursae about two-thirds of length of corpus bursae, from ostium to about four-fifths of its length strongly sclerotized.

Corpus bursae elongate pear-shaped with two tiny V-shaped signa, entrance of ductus seminalis in upper part of corpus bursae, slightly lower than entrance of ductus bursae.

**D i s t r i b u t i o n.** The distribution of *Cosmopterix athesiae* sp. n. is insufficiently known since only few specimens have been recorded from a vast area including the Mediterranean parts of Europe (southern Spain, northern Italy, Greece) and parts of Central Africa.

**B i o n o m y.** Host-plants and early stages are unknown. The few adults known from Europe have been observed from late June to early September, but data from Africa indicate at least two generations from mid-March to early April and from late November to early December. The moth is attracted to light but it was also found during the day.

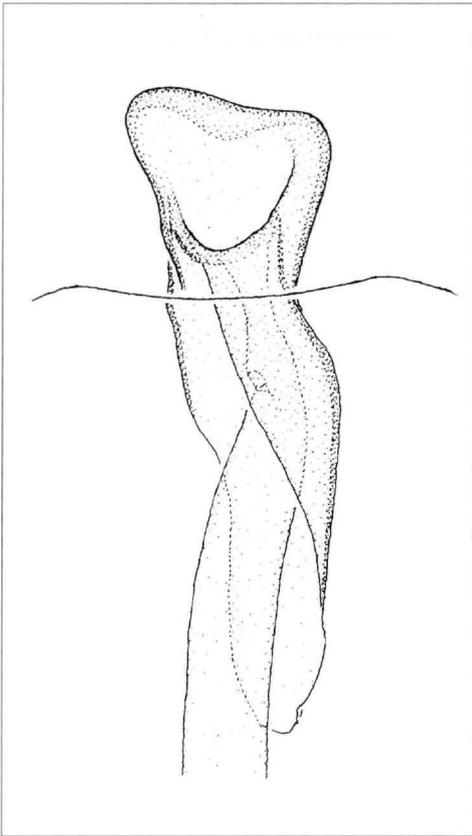


Fig. 5: *Cosmopterix athesiae* sp. n., sterigma (line drawing by S. Koster)

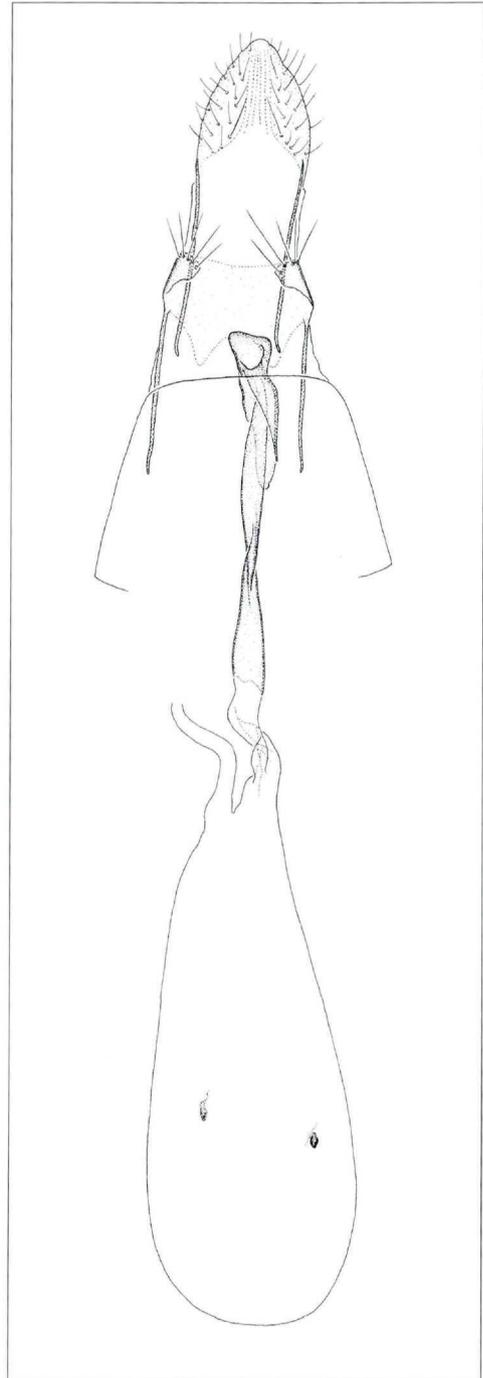


Fig. 4: *Cosmopterix athesiae* sp. n., female genitalia (line drawing by S. Koster)



Fig. 6: Habitat of *Cosmopterix athesiae* sp. n. in Spain (Castellon, Sierra d'Espadan, SE Almedijar) (photograph by P. Huemer)

**H a b i t a t** (Figs. 6–8). The habitat is insufficiently documented but in Europe the new species seems to be prefer oak forests rather than wetland habitats as some of the related taxa. HARTIG (1964) fumigated his specimen from an oak and also the single adult known from Spain was collected within a large forest of *Quercus coccifera*. In Cameroon the habitat was a bushy and wooded mountain slopes. At the spots itself the traditional burning of grass in January changed the natural composition of the insect fauna. The collecting could only be focussed on canopy feeding mining moths or species pupating deeply in the ground (J. De Prins, pers. comm.). In Tanzania the moths have been collected at the veranda of a house in a suburban area mixed with some patches of natural vegetation (Aarvik, pers. comm.).

**R e m a r k s**. The adult resembles externally *Cosmopterix gracilis* SINEV, 1985, known from Japan, South-Korea and the Far East of Russia (PARK 1994). In *Cosmopterix gracilis* the ground colour of the forewing is light brown instead of dark brown and it lacks the double white line on the tegulae. Externally it also resembles *Cosmopterix ingeniosa* MEYRICK, 1909, a species described from India, and also known from Madagascar (VIETTE 1947) and Seychelles and d'Aldabra Islands (LEGRAND 1965), but *Cosmopterix ingeniosa* also lacks the double white line on the tegulae and the central white lines on the head and thorax. In Europe the adult resembles *Cosmopterix coryphaea* WALSINGHAM, 1908 and *Cosmopterix pararufella* RIEDL, 1976, but it can easily be distinguished from either of them by the complete subdorsal white line in the basal part forewing, the lack of the white costal line, and the double lined tegulae. In North America *Cosmopterix dapifera* HODGES, 1962 has a similar wing pattern as *C. coryphaea* and *C. pararufella*, but it has also the double white lining on the tegulae. However the male and female genitalia of *C. dapifera* differ considerably from *C. athesiae* sp. n. Although the double white lining of the tegulae is very rare in the genus *Cosmopterix*, it is not unique. Also in the collection of the RMNH are two undescribed species of *Cosmopterix* from Indonesia with similar lines on the tegulae (Koster, pers. obs.).

In the male genitalia it shows similarities with *Cosmopterix longivalvella* KUROKO & LIU, 2005, a species occurring in China (KUROKO & LIU 2005). However in *C. longivalvella* the apical protrusion of the aedeagus is much shorter and the valvae are not widened distally. Instead *Cosmopterix longivalvella* has



Figs. 7–8: Habitat of *Cosmopterix athesiae* sp. n. in Cameroon (Faro River Reserve) (photograph by J. De Prins)

on the valvae a dentate plate ventrally before apex. Also the very long apical protrusion of the aedeagus is not unique. It has also been found in the male genitalia of an undescribed *Cosmopterix*-species from Kenya (Koster, pers. obs.).

The almost complete sclerotization of the wall of the ductus bursae in the female genitalia is very exceptional. It is very likely meant to strengthen the wall and prevent it from damage by the insertion of the long protrusion of the aedeagus during mating, because the tip of this protrusion is rather sharp and dentose.

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