Anania ochrofascialis (Christoph) comb. n. and *A. murcialis* (Ragonot) comb. n. – two vicarious species from the western Palaearctic region (Pyraloidea: Crambidae: Pyraustinae)

Andreas Tränkner & Matthias Nuss

Senckenberg Museum of Zoology, Koenigsbruecker Landstrasse 159, 01109 Dresden, Germany; andreas.traenkner@senckenberg.de; matthias.nuss@senckenberg.de

Abstract. With this contribution, we continue to investigate the generic classification of European Pyraustinae based on synapomorphic characters. Further taxa are recognized which are related to *Anania* Hübner, 1823. The monotypic genus *Ametasia* Martin, 1986 **syn. n.** is synonymised with *Anania* and two species are transferred to this genus: *Anania ochrofascialis* (Christoph, 1882) **comb. n.**, the type-species of *Ametasia*, and *Anania murcialis* (Ragonot, 1895) **comb. n.** Both species were formerly provisionally placed in *Achyra* Guenée, 1849. The two species are closely related as they cannot be distinguished according to characters of copulatory organs. They are vicarious in the Mediterranean region of the western Palaearctic, with *A. murcialis* occurring in Spain and Morocco, and *A. ochrofacialis* in Ukraine, southern part of European Russia, Azerbaijan, south of Dead Sea, Egypt, and Kazakhstan.

Introduction

In 2005, Leraut suggested a new concept for *Anania* Hübner, 1823 based on synapomorphic characters of the male and female copulatory organs. That approach has been adopted for Chinese and Afrotropical taxa by Tränkner & Nuss (2009). Since then we have investigated further the European Pyraustinae, some of which are rarely represented in collections. Among these is the monotypic genus *Ametasia* described by Martin (1986) for *Metasia ochrofascialis* Christoph, 1882, based on copulatory organ characters which are distinct from those of the remaining species of *Metasia* Guenée, 1854. However, no hypothesis has been available for phylogenetic relationships of that taxon until today. Merely Speidel (1996) and Zolotuhin (2005) placed *ochrofascialis* provisionally in *Achyra* Guenée, 1849. However, both authors overlooked the fact that *ochrofascialis* is the type species of the monotypic genus *Ametasia*, and did not synonymise it with *Achyra*. A further species provisionally placed in *Achyra* is *A. murcialis* (Ragonot, 1895) from Spain (Karsholt 1996). In this paper we present the results of our investigation of these taxa, which clarify their generic position within the Pyraustinae and point to some interesting biogeographical patterns.

Methods

Copulatory organs were prepared and mounted according to the standards suggested by Robinson (1976). Images of the copulatory organs were taken using NIKON Eclipse 600 microscope with ZEISS AxioCam MRc5 digital camera. The terminology follows Marion (1954, 1959), Kristensen (2003), and Nuss & Speidel (2005).

Abbreviations

AT	Andreas Tränkner
MTD	Senckenberg Museum für Tierkunde Dresden
prep.	preparation of genitalia
ZMHB	Museum für Naturkunde der Humboldt-Universität zu Berlin
ZMUC	Zoological Museum, University of Copenhagen

Results

The taxa investigated here share the apomorphic characters of *Anania*. These are a strong sclerotised elongated asymmetric sclerite in the phallic apodeme (Figs 3–4) and a digitiform sclerotisation in the female antrum (Figs 5–6) (see Leraut 2005; Tränkner & Nuss 2009). Therefore, we here transfer *Metasia ochrofascialis* Christoph, 1882 and *Botys murcialis* Ragonot, 1895 to *Anania* in the combination *Anania ochrofascialis* (Christoph, 1882) **comb. n.** and *Anania murcialis* (Ragonot, 1895) **comb. n.** Because *Metasia ochrofascialis* Christoph, 1882 is the type-species of *Ametasia* M. O. Martin, 1986: 71–72 (by original designation and monotypy) and because we are transferring this species to *Anania*, we hereby synonymise *Ametasia* M. O. Martin, 1986 **syn. n.** with *Anania*.

Anania ochrofascialis (Christoph, 1882), comb. n. Figs 1, 3, 5

Metasia ochrofascialis Christoph, 1882: 121–122. – Type locality: Russia, Dagestan, Derbent (determined by lectotype designation by Munroe 1970: 1033, but misspelled as "ochrifascialis"; paralectotypes are from Azerbaijan, Ordubat and Russia, Elisabethpol).

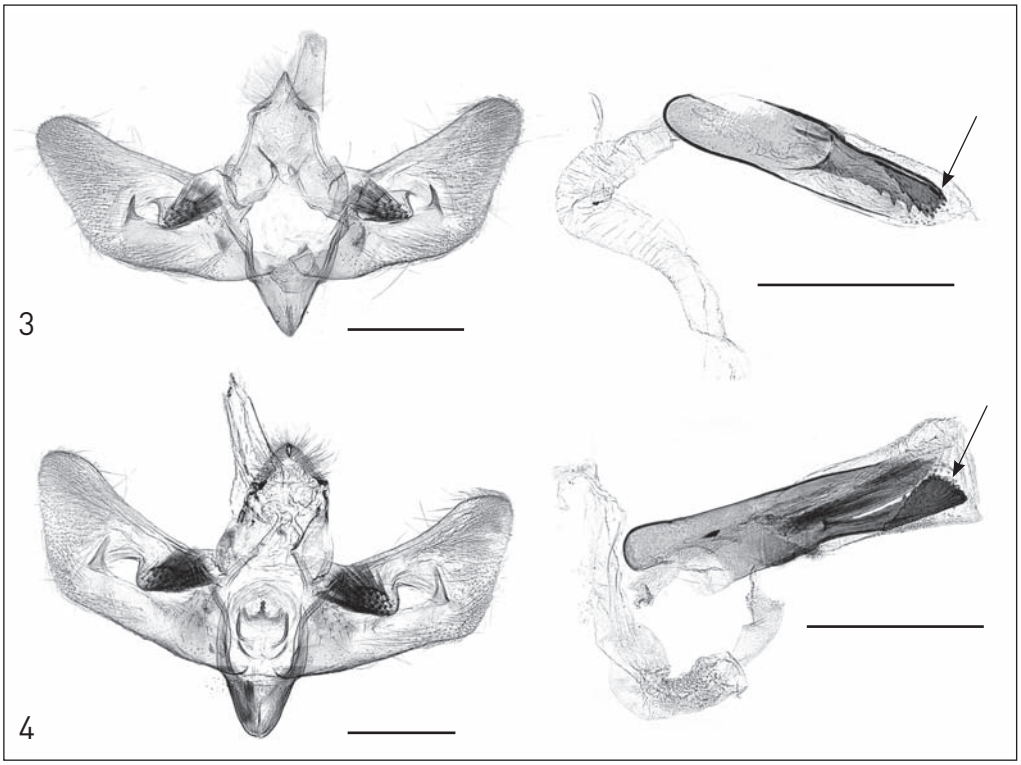
Botys retowskyi Möschler, 1888: 128. – Type locality: Ukraine, Crimea, Feodosia. – Rebel 1902: 107 (syn.).

Hypotia bilinea Bethune-Baker, 1894: 46, pl. 1 fig. 15. – Type locality: Egypt, Alexandria. – Speidel 1996: 193, 326 (syn.).

Material. Holotype (by monotypy) of *Botys retowskyi* Möschler (Fig. 1): "Origin", "Type", "Holotype | *Botys* | *Retowskyi* | Möschler 1888 | des. V. Zolotuhin", "Krim | Ret. 81", Retowskyi | Möschl.", "coll. Möschl.", "ZMHU-Berlin | Pyr-Z 05", ZMHB. – 1♂, [country?], southern end of Dead Sea, 1.–27.iii.1933, leg. Amsel; 1♂, Azerbaijan, 60 km south of Baku, Gobustan, 9.vi.1999, leg. I. Pljuschtsch (prep. AT 161); 2♂, 2♀, Kazakhstan, Ili-River, 43°20'N 79°52'E, 500 m, softwood riparian forest on sand, 20.vi.2000, leg. M. Nuss (prep. AT 162, 168, 179); MTD.

Redescription (Fig. 1). Forewing length 7.0–9.0 mm (n = 7). Labial palpi porrect, beige laterally, white ventrally; maxillary palpi stilett-shaped, beige. Antennae of both sexes filiform, dorsally whitish scaled, ventrally with ciliate sensillae. Forewing apex acute; ground colour whitish with beige to pale brown pattern elements. Basal half of costa light brown. Antemedian line starting near costa at one-third of wing, running straight towards one-quarter of dorsum. Discoidal cell with ovate spot close to costal origin of antemedian line; distal discoidal stigma spot-like. Postmedian line starting from costa at three-quarter, running parallel to termen, curved sinusoid in middle of wing, ending at middle of dorsum. Subterminal area brown, with white spots between veins. Fringe at base pale yellow, followed by brown, distally beige and whitish cheq-

Figs 1–2. Adults of *Anania*. **1.** *A. ochrofascialis*, holotype of *Botys retowskyi* Möschler from Ukraine, Crimea (ZMHB). **2.** *A. murcialis* from Spain, Almeria (ZMUC).



Figs 3–4. Male copulatory organs of *Anania*. Arrows: asymmetric sclerite of phallic apodeme. **3.** *A. ochrofascialis* from Kazakhstan, prep. AT179 (MTD). **4.** *A. murcialis* from Spain, Almeria, prep. AT163 (ZMUC). Scale bars: 0.5 mm.

uered. Hindwing white, with median line sinusoid and subterminal area brown, with white spots between veins; fringe as in forewings.

Male terminalia (Fig. 3). Uncus broad, triangular, weakly sclerotised, laterally slightly concave, weakly setose, distally pointed. Valvae basally broad, with costa nearly straight, ventral margin conspicuously narrowing from middle of valva towards

apex, the latter round. Vinculum dorso-laterally with membrane with loose-fitting brush of hair-like coremata with broadened tip (not shown in Fig. 3). Mesal wall of valva mediobasally with slightly elevated sclerotisation adorned with some straight bristles; sella and editum bearing many lamellae, directed dorsally; middle of valva with sclerotised spine directed dorsally. Phallus apodeme with conspicuously elongate sclerite reaching posterior end of phallus, posterior half of sclerite with serrated edge. Males investigated have no deciduous cornuti left in the phallus, but a female (Fig. 5) contains cornuti in the corpus bursae and appendix bursae.

Female terminalia (Fig. 5). Corpus bursae with rhomboid signum; appendix bursae attached laterally. Ductus bursae membranous, slightly curved, broadly enlarged anterior to antrum; colliculum not differentiated, ductus seminalis arising close to antrum. Antrum sac-like, enlarged, sclerotised, with free digitiform sclerotisation extending to posterior edge of antrum.

Differential diagnosis. Among all *Anania* species known to us, *A. ochrofascialis* is most similar to *A. murcialis*, redescribed below.

Distribution: Ukraine, southern part of European Russia, south of Dead Sea, Azerbaijan, Egypt, and Kazakhstan.

Remarks. We did not investigate the lectotype of *Anania ochrofascialis*, but it is figured by Zolotuhin (2005: text-fig. 9, colour-fig. 5). He also figured the holotype of *Botys retowskyi* (Zolotuhin 2005: colour-fig. 6) and confirmed its synonymy to *A. ochrofascialis*.

Anania murcialis (Ragonot, 1895), comb. n. Figs 2, 4, 6

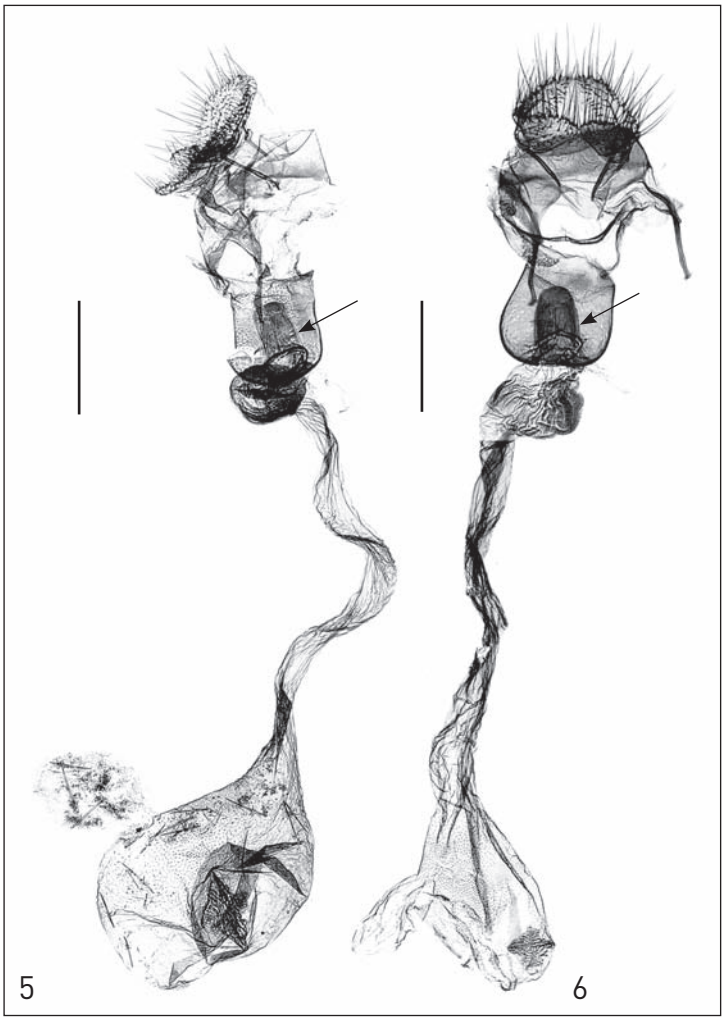
Botys (*Phlyctaenia*) *murcialis* Ragonot, 1895: 23. – Type locality: Spain, Province of Murcia, Algezares.

Material. 2♂, 2♀, Spain, Almeria, Mini Hollywood, 300 m, 15.v.1993, leg. B. Goater (prep. AT 163, 164), ZMUC.

Redescription. Forewing length: 9.0 – 10.0 mm (n = 4). Similar to *A. ochrofascialis* except labial palpi brown laterally; maxillary palpi brown. Antennae of both sexes dorsally brown scaled. Forewing with pale brown pattern elements conspicuously suffused by black scales; antemedian line starting near costa at one-quarter of wing; centre of discoidal cell with small black spot clearly distant to antemedian line; distal discoidal stigma a large brown spot, suffused black. Subterminal area with white, basally black-filled triangles between veins. Fringe with row of long scales, whitish at base, dark brown at tip, covered by second row of short, concolorous scales. Hindwing subterminal area with large white, black-filled ellipses between veins (Fig. 2).

Male terminalia (Fig. 4). Similar to *A. ochrofascialis* except uncus laterally straight. Valvae with costa slightly concave, ventral margin conspicuously narrowing from two thirds of valva towards apex. Phallus with numerous, straight deciduous cornuti.

Female terminalia (Fig. 6). Similar to *A. ochrofascialis* except ductus bursae straight.



Figs 5–6. Female copulatory organs of *Anania*. Arrows: Digitiform sclerotisation of antrum. **5.** *A. ochrofascialis* from Kazakhstan, prep. AT 162 (MTD). **6.** *A. murcialis* from Spain, Almeria, prep. AT 164 (ZMUC). Scale bars: 0.5 mm.

Differential diagnosis. In wing pattern elements *A. murcialis* is similar to *A. ochrofascialis*, but conspicuously suffused by black scales; the antemedian line starts more basal at costa and runs less oblique towards dorsum; the proximal spot in the discoidal cell is clearly distant to the antemedian line and the subterminal area is white with basally black-filled triangles between veins (instead of white spots). In genitalia, we did not find convincing differences between the two species. The possible differences that might be recognised in Figs 3–6 need to be investigated on a larger number of specimens.

Distribution: Only known from Spain and Morocco (Lucas 1942: 63; Rungs 1979: 172).

Remarks. *Botys murcialis* Ragonot, 1895 has been provisionally transferred to *Achyra* Guenée, 1849 by Karsholt (1996: 326), thus becoming a junior secondary homonym of the New World *Achyra murcialis* (Walker, 1859), originally described in *Ebulea*

Doubleday, 1849 and transferred to *Achyra* by Munroe (1976: 47). A replacement name has never been given for the secondary junior homonym '*Achyra murcialis* (Ragonot, 1895)'. However, since here we transfer *Botys murcialis* Ragonot, 1895 to *Anania* Hübner, 1823, the establishment of a replacement name is not necessary anymore.

Botys murcialis Ragonot, 1895 has been described based on two females. Unfortunately, the syntypes could not been traced at the Muséum National d'Histoire Naturelle in Paris (P. Leraut, pers. comm. to M. Nuss), where Ragonot's Microlepidoptera collection is deposited (Horn et al. 1990: 317). However, the identity of the species is verifiable unambiguously when compared to the original description.

Discussion

With *Anania ochrofascialis* and *A. murcialis*, the European fauna of *Anania* now comprises 15 species. Among them, *A. ochrofascialis* and *A. murcialis* might be regarded as close relatives due to their similar wing pattern elements and their nearly identical copulatory organs. In contrast to all other *Anania* species, these two species show a postmedian line that starts from the costa and runs parallel to the termen. Ragonot (1895), who did not mention *A. ochrofascialis*, compared *A. murcialis* as similar to *A. perlucidalis* in the colour and shape of the wings and treated both species in the subgenus *Phlyctaenia* Hübner, 1825 (now a synonym of *Anania*). However, wing pattern elements in common between *A. ochrofascialis*, *A. murcialis* and *A. perlucidalis*, e.g. presence of antemedian and postmedian lines, proximal and distal discoidal spots, are also shared by most other *Anania* species e.g. *A. verbascalis* (Denis & Schiffermüller, 1775), *A. oberthuri* (Turati, 1913), *A. crocealis* (Hübner, 1796), *A. lancealis* (Denis & Schiffermüller, 1775), as well as by non-*Anania* pyraustines, such as *Ostrinia nubilalis* (Hübner, 1796), *Paratalanta pandalis* (Hübner, 1825), or *Paracorsia repandalis* (Denis & Schiffermüller, 1775). Thus, these characters might be plesiomorphic. Also, the structures of the copulatory organs do not support a close relationship between *A. ochrofascialis* and *A. murcialis* on the one hand, and *A. perlucidalis* on the other. In *A. perlucidalis*, the sclerite of the phallic apodeme is deeply cleft whereas in *A. ochrofascialis* and *A. murcialis* it is not cleft, and thus similar to that of *A. funebris* (Ström, 1768) and *A. verbascalis*. Thus, the relationship of *A. ochrofascialis* and *A. murcialis* within *Anania* remains uncertain and the application of molecular techniques might be the prime tool for a phylogenetic reconstruction of *Anania* species.

According to the available data, *A. ochrofascialis* and *A. murcialis* might be vicarious species in the Mediterranean region of the western Palaearctic, with *A. murcialis* occurring in Spain and Morocco, and *A. ochrofacialis* in Ukraine, southern part of European Russia, Azerbaijan, south of Dead Sea, Egypt, and Kazakhstan. So far, we have been unable to trace specimens for the region situated between Morocco and Egypt, e.g. from Tunisia, where a number of entomologists have collected during the last decades. For a better understanding of the two species, the discovery of their life-history, especially of the larval host-plants, will be significant.

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