

Palaeartic elements in the Cochylini fauna of the Oriental Region (Lepidoptera, Tortricidae)

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Summary

The Palaeartic elements in the Oriental Cochylini fauna and the distribution of the genera occurring in that region are discussed. The Cochylini species recorded from Pakistan and Kashmir are listed as Palaeartic and those from southern China are treated as Oriental. Several taxonomic changes are made.

Résumé

Discussion sur les éléments paléarctiques de la faune des Cochylini orientaux et sur la répartition des genres de cette tribu présents dans la région orientale. Les espèces de Cochylini signalées du Pakistan et du Cachemire sont considérées comme paléarctiques et celles de la Chine méridionale comme orientales.

An important collection of Indian Tortricidae, was kindly provided for study by the late Dr. W. THOMAS, Bad Nauheim, Germany. The Cochylini were represented by five species, three of which are Palaeartic. The Cochylini of the Oriental region are still insufficiently known and there are vast areas over which these moths have never been collected. For this reason, even the five species collected by Dr. THOMAS have provided valuable information. These records, and data obtained from the literature, allow a preliminary discussion on the components of the Palaeartic and Oriental Cochylini faunas.

List of species collected by Dr. W. THOMAS

Stenodes jaculana (SNELLEN). One specimen from the vicinity of Gund, Kashmir, ca 2200m, 14.viii.88. Recorded from South-East Siberia, Mongolia, Korea and Tibet (Batang); also known from Yunnan (China) in the Oriental Region.

Stenodes halophilana (CHRISTOPH). Several species collected in Ladakh in the vicinity of Kharbu, 2800m, 11.viii.88. The species is distributed from the Caucasus to Iran and Afghanistan.

Eupoecilia dynodesma (DIAKONOFF). One specimen collected in Khanbu, Ladakh, 2800 m, 14.viii.88. Until now, known only from North-West Karakorum.

Eupoecilia sp. Three specimens from Tigerhill, Darjeeling, 29-31.viii.88. These are probably conspecific with *E. lata* (RAZOWSKI, 1987), but a specific determination is not possible as all specimens are females.

Aethes pardaliana (KENNEL). One specimen collected in the vicinity of Sonamarg, Kashmir, 2900 m, 13.viii.88. Distribution: North-East Iran, central and eastern Afghanistan and Uzbekistan (Samarkand).

Taxonomic remarks

There is little data on Oriental Cochylini to be found in the literature, but two useful papers devoted to this tribe have been published (DIAKONOFF, 1984; RAZOWSKI, 1984). In the latter work, 34 species were grouped within 6 genera, whilst the former study listed 50 species belonging to 10 genera. Before the following analysis can be presented, some changes and corrections to the aforementioned papers must first be given.

All species which I included in *Phalonidia* LE MARCHAND, should now be transferred to *Piercea* FILIPJEV, as the latter is now accepted as a valid genus (RAZOWSKI, 1987). This results in the following new combination: *Piercea attenuata* (RAZOWSKI, 1984) — **comb. n.**

Changes since DIAKONOFF (1984): *Piercea mellita* (MEYRICK) — **comb. n.** (this species is not Asian, but Australian), *Piercea definita* (MEYRICK) — **comb. n.**, *Piercea pista* (DIAKONOFF) — **comb. n.** and *Piercea datesis* (DIAKONOFF) — **comb. n.** *P. sphaenoptera*, which was incorrectly transferred to *Aethes* BILLBERG and *P. permixtana* (DENIS & SCHIFFERMÜLLER) also belong to *Piercea*. The latter's occurrence in Sri Lanka requires confirmation as it can easily be confused with *P. attenuata*, *P. pista* and *P. datesis*. *Aethes irmazona* (DIAKONOFF) is a noctuid moth, and *Stenodes innotatana* (Warren) was incorrectly placed within *Agapeta* HÜBNER. *Agapeta hamana* (LINNAEUS) and *Cochylis hybridella* (HÜBNER) were considered to be Oriental species, but they appear to be exclusively Palaearctic. The records of these species, and that of *Stenodes innotatana* from Punjab, require reexamination. It is also important to mention that *Cryptocochylis* RAZOWSKI is not represented in the Oriental region as *dynodesma*

DIAKONOFF, which was described in that genus, actually belongs to *Eupoecilia* STEPHENS. The genus *Heliocosma* MEYRICK has not been examined genitally and its systematic position is completely obscure. A new species, *hapala*, was placed in *Stenodes*, but its systematic position is uncertain as it exhibits some characters common to *Cochylis* TREITSCHKE, except for the plesiomorphic cornutus. It is very close to *S. moriutii* KAWABE, 1987, also from Thailand. These species, which are unknown to me, require reexamination and are excluded from this discussion.

Discussion

The boundaries of the Oriental region are variably defined in the lepidopterological literature, but those proposed for the series Microlepidoptera Palaearctica (AMSEL, GREGOR & REISSER, 1965: xx) are usually accepted i.e. China is largely included, but most of Pakistan and Kashmir are excluded. In this paper, the limits discussed and defined by DE LATTIN (1967) are accepted (Fig. 2). Thus the species recorded from Pakistan and Kashmir by DIAKONOFF (1984) and RAZOWSKI (1984) are considered to be exclusively Palaearctic: *Stenodes innotatana* (WARREN), *S. scoptes* (RAZOWSKI), *Phalonidia contractana* (ZELLER), *Eupoecilia dynodesma* (DIAKONOFF), *Aethes bilbaensis* (RÖSSLER), *Ae. lateritia* RAZOWSKI, *Ae. pardaliana* (KENNEL), *Ae. conomochla* (MEYRICK), *Cochylis faustana* (KENNEL) and *C. apricana* (KENNEL). Likewise, all species known to exist in southern China and until now considered to be exclusively Palaearctic, should now be included within the Oriental fauna. These species are as follows: *Stenodes maleropa* (MEYRICK), *S. isocornutana* RAZOWSKI, *Phalonidia droserantha* (MEYRICK), *Ph. melanothica* (MEYRICK), *Piercea mesotypa* (RAZOWSKI), *Cochylis psychrasema* (MEYRICK) and *Aprepodoxa mimocharis* (MEYRICK).

Some species discovered in the intermediate zone, such as Kiangsu and Hunan, are certainly common to both regions and are of uncertain origin. However, from what one can judge from their known distributions, they appear to be more Palaearctic. Even species such as *Aethes hoenei* RAZOWSKI, so far known only from Kiangsu and Hunan, may yet be found further north and may prove to be of Palaearctic origin. One species, *Cochylis indica*, which has recently been discovered in Kathmandu, Nepal (DIAKONOFF, 1984), almost certainly entered the Oriental Region from the west (Fig. 1). Other species recorded from Pakistan and Kashmir may show a similar tendency in their distribution (Fig. 1) and they also require the same relatively dry environmental

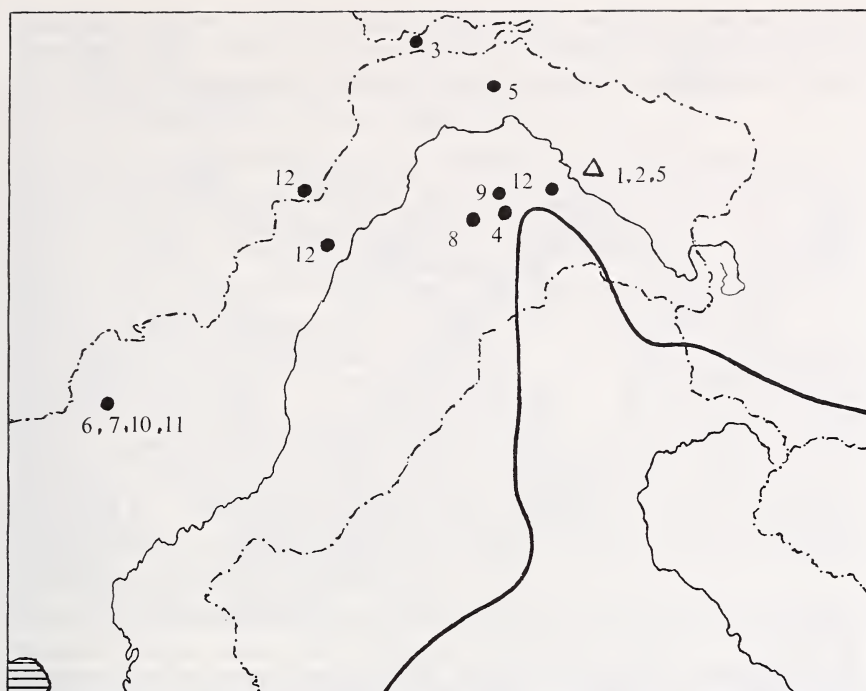


Fig. 1. Distribution of Palaearctic species of Cochylini at the western border of the Oriental Region. 1. *Stenodes halophilana* (CHR.), 2. *S. jaculana* (SNELL), 3. *S. innotatana* (WARR.), 4. *Phalonidia contractana* (ZELL.), 5. *Eupoecilia dynodesma* (DIK.), 6. *Aethes lateritia* RAZ., 7. *Ae. bilbaensis* (RÖSSL.), 8. *Ae. conomochla* (MEYR.), 9. *Ae. pardaliana* (KENN.), 10. *Cochylis apricana* (KENN.), 11. *C. faustana* KENN., 12. *C. indica* RAZ.. Thick line — border of Oriental Region after DE LATTIN, 1967 ; triangle — place name (Gund, Kharbu) not located precisely.

conditions. Further evidence to support this suggestion is the discovery of *Stenodes jaculana* in Kashmir. This is an eastern Palaearctic species found in Tibet. This suggests that *jaculana* may also occur in the mountainous regions lying between the two areas, and also in the Oriental Region. Three of the remaining species are transpalaearctic, namely *Piercea vectisana* (HUMPHREYS & WESTWOOD), *P. permixtana* (DENIS & SCHIFFERMÜLLER) and *Aethes cnicana* (WESTWOOD), of which ssp. *taiwanica* RAZOWSKI occurs specifically in Taiwan (Oriental Region). These species, and *Stenodes hedemanniana* (SNELLEN), *Eugnosta metaphaella* (WALKER), *Eupoecilia citrinana* RAZOWSKI and *Aethes mesomelana* (WALKER) would appear to have spread into the Oriental Region by a north-easterly route.

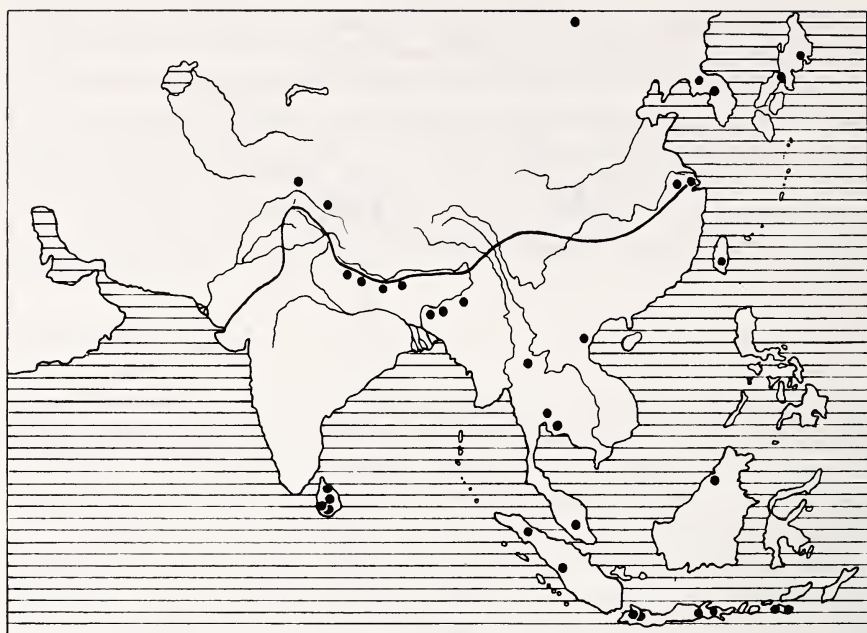


Fig. 2. Distribution of *Eupoecilia* STEPH. in the Oriental Region and adjacent parts of the Palaearctic. Thick line — border of Oriental Region, after DE LATTIN, 1967.

The Oriental Cochylini genera

In the Oriental Region, the following nine genera are known to exist : *Stenodes* GUENÉE, *Phalonidia* LE MARCHAND, *Piercea* FILIPJEV, *Eugnosta* HÜBNER, *Eupoecilia* STEPHENS, *Aethes* BILLBERG, *Cochylidia* OBRAZTSOV, *Cochylis* TREITSCHKE and *Aprepodoxa* MEYRICK. The Oriental genus, *Aprepodoxa*, occurs at least in the south-eastern areas of the Palaearctic, whereas all the remaining are widely distributed, some also in other Regions.

Stenodes is almost exclusively Palaearctic ; its ranges from the most western parts of the subregion to Japan. Its southern limit of distribution encompasses Chekiang, Hunan and Yunnan, Tibet, Kashmir, Arabia and the southern Mediterranean. There is no evidence of the western species of the genus occurring in the Orient, whereas the eastern Palaearctic species hardly appear to penetrate the Oriental region. This observation is certainly related to the eremial characteristics displayed by the genus. *Stenodes* appears to have at least two distribution

(refugial) centres (DE LATTIN, 1957). The western species of the *meridiana* and *cultana* groups survived the Pleistocene glaciations in the Syrian and Turkestan eremial centres, the eastern Palaearctic species (*woliniana* group) in the Sinoeremial centre.

Another genus considered to be eremial due to its foodplants and present distribution is *Cochylis*. It is found to occur throughout the whole of the Palaearctic, but mainly in the steppe and steppe-forest zones. There are therefore many more species in western and central parts (as far as Kazakhstan) than in the east. *Cochylis* occurs in the Nearctic Region and extends to the southern part of the Neotropical Region. Its invasion of the Oriental region was greatly limited by the humidity of the forest zones. Only two species are considered to be endemic in this region: *C. aethoclasma* (DIAKONOFF) found in Nepal and *C. laetana* RAZOWSKI found in Assam, this being the most southerly occurrence of this genus. *C. psychrasema* (MEYRICK) is common to both regions as it has been recorded in Tibet and Xizang, China, whilst *C. indica* RAZOWSKI has spread into the Oriental Region from the west as already mentioned.

The distribution of *Aethes* is similar to that of *Cochylis*. Two exclusively oriental species exist, *Ae. delotypa* RAZOWSKI and *Ae. geniculata* (MEYRICK) found in Yunnan and Assam respectively. As previously mentioned, *Ae. mesomelana* and *Ae. cnicana* occur in the Oriental Region, but are Palaearctic elements.

The following three genera were found to show some similarities with the *Cochylis* and *Aethes*. *Cochylidia* is a transpalaearctic genus. *C. altivaga* (DIAKONOFF) is the only species of this genus to be found in Nepal (being the most southern point of the distribution of *Cochylidia*). *Eugnosta* is also represented by only one species, *E. metaphaella*, common to the two regions. This genus can be considered Palaearctic if *Carolella* BUSCK, which is distributed throughout the New World, and some undescribed Ethiopian species are not congeneric. *Phalonidia* has a wide distribution in the Holarctic Region and has spread into the Neotropical Region where several very closely related genera have evolved. Three species are known from the Oriental Region. *Ph. melanothica* (MEYRICK), is known from Chekang (Palaearctic) and Kiangsu (Oriental), whereas the two other species, *Ph. mesotypa* RAZOWSKI and *Ph. droserantha* (MEYRICK) from Kiangsu and Yunnan respectively, are Oriental, but may also be found in Palaearctic areas. It is likely that all *Phalonidia* species known to exist in the Oriental Region are Palaearctic elements. One western Palaearctic species, *Ph. contractana*, reaches as far as Kashmir, and may have

a similar distribution to some species of *Cochylis* occurring in that area.

Piercea is found to be distributed in the Nearctic, Oriental and Australian (*P. mellita* only) Regions. The number of species in the Palaearctic compared to that in Oriental Region is almost equal (9 & 8 respectively), and the species *P. vectisana* and *P. permixtana* are found to be common to both. These two species, together with *P. minimana* (CARADJA), are transpalaearctic, while four species occur in the western Palaearctic and two are exclusive to the eastern Palaearctic. The majority of species are bound to rather humid biotopes, although no data exists for *P. amasiana* (RAGONOT) and *P. rubricana* (PEYERIMHOFF), and so it is possible that the genus could easily adapt to tropical biotopes. Due to the lack of data it is not yet possible to determine the distribution centre of this genus.

The distribution of **Eupoecilia** is wide (Fig. 2). It ranges from the Iberian Peninsula to Japan in the Palaearctic subregion, Sri Lanka in the south western Oriental Region, and through Indonesia and New Guinea to the Solomon Islands. The genus does not occur in the Nearctic, but probably colonised the Pacific Islands since the early Pleistocene. At about the same period, the cold climate of the northern parts of Asia and America probably prevented *Eupoecilia* from penetrating into the New World. As far as it can be deduced from the rather scarce bionomic data, *Eupoecilia* appears to be largely bound to humid biotopes, despite the fact that some western Palaearctic species have adapted to dry regions and their larvae utilise plants characteristic of these areas. In the Palaearctic, only eight species are found to occur, of which two are transpalaearctic, two are western Palaearctic and two are eastern Palaearctic. Four species have been found in the Australian Region and 20 occur in the Oriental Region. Taking into consideration the distribution and ecological requirements of the genus, it can be assumed that *Eupoecilia* is of Oriental origin. It is, however, impossible to localise the dispersion centre of the genus with our present knowledge. Areas with higher than average species concentrations are Sri Lanka (4 species), Northern India (5 species), Sumatra (6 species) and Java (6 species).

Conclusions

The Cochylini have been used to analyse the distribution of eremic groups of Lepidoptera in the Oriental region. Almost all of the genera living in this region are of Palaearctic origin; only *Eupoecilia* is regarded as being of Oriental origin (*Aprapodoxa* is excluded from

this study due to the insufficient knowledge of this genus). The northern parts of the Oriental Region, such as Nepal, China : Yunnan, Hunan and Chekang, form a broad transition zone representing the limits of distribution of the majority of Cochylini genera. Cochylini species spread into the Oriental Region more from the north-east, rather than from the west, where ecological gradients are smaller. For this reason, the eastern Palaearctic fauna is found to be more closely related to the Oriental rather than to the western Palaearctic fauna.

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