



# DAS TIERREICH

## Eine Zusammenstellung und Kennzeichnung der rezenten Tierformen

The „TIERREICH“ was initiated by the German Zoological Society in order to create a complete systematical treatment of all groups of the recent animal kingdom. After the World War II this undertaking was stopped because it seemed impossible to attain its completeness. In consequence of that, however, also ceased both incitement and possibility of publishing comprehensive revisions of large animal groups in a continued series. Therefore the Verlag Walter de Gruyter & Cie. (Berlin) came to the conclusion to revive the „TIERREICH“. The original views will be maintained, the work, however, is planned now as an unconstrained sequence of systematical monographs without intending to treat all zoological categories according to a fixed plan. These monographs should not be restricted only to the belongs of taxonomy but also have regard to anatomical, biological, physiological, and other facts as far as they are able to characterize the group in question without breaking the frame of the whole work. All authors who are willing to publish systematical revisions of recent animal groups are invited to collaborate. According to the wishes of the authors, their contributions will be printed in English, French, or German. The authors will get an honorarium of DM 55,— for each 16 printed pages and 5 free copies after come out of their contributions. Further details may be gathered from the exemplaries no. 72 and subsequents published since 1958; by request the publishers will give any informations or send exact directions for the authors. Summary revisions of zoological groups (checklists) will although be published in the series „DAS TIERREICH“.

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Le „TIERREICH“ fut fondé par la Société Allemande de Zoologie dans le but de réaliser une présentation complète de la systématique de tous les groupes zoologiques récents. Cette entreprise fut suspendue après la deuxième guerre mondiale car la présentation complète que l'on s'était fixée pour but semblait impossible à réaliser. Mais, de ce fait, disparut, avec la possibilité, le stimulant nécessaire à la publication continue d'amples révisions de groupes zoologiques importants. C'est pourquoi, les éditions Walter de Gruyter & Co. (Berlin) ont pris la décision de faire renaître le „TIERREICH“ sous l'optique originale pour ce qui est du fond, certes, mais uniquement sous la forme d'une série de monographies systématiques, sans lien étroit entre elles dont le but ne sera pas de traiter tous les groupes zoologiques d'après un plan préconçu. Ces monographies ne doivent pas simplement se borner au domaine de la taxonomie, mais tenir compte également des faits anatomiques, biologiques, physiologiques et autres dans la mesure où ils sont susceptibles de mieux caractériser le groupe



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# **Familia Agaristidae I**

(Palaeartic and Oriental Genera)

Bearbeitet von

**Prof. Dr. S. G. Kiriakoff**



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## Introduction

The structure of the antennae has been generally considered as the main character differentiating the Agaristid moths from the bulk of the Noctuids. HAMPSON in his Catalogue, part 3 and supplement 2 has followed this usage and placed a number of genera dealt with in the present work in the family Noctuidae, subfamily Acronyctinae (Catalogue part 9). JORDAN, and later DRAUDT (both in SEITZ's *Macrolepidoptera of the World*) have not followed HAMPSON: their Agaristidae (of Agaristinae) include genera with the typical "agaristine" antennae along genera with filiform, ciliate and pectinate antennae. STRAND in *Lepidopterorum Catalogus*, part 5, was still more comprehensive, and put in his subfamily Agaristinae, besides the above, quite a number of genera placed by every other systematist with the true Noctuidae.

The author of this revision, having examined the tympanic organs of most of the Agaristid genera, found that these structures possess in all the genera studied a *Bulla abdominalis*, an apomorphic structure not found elsewhere. This synapomorphy, quite independent of the antennal structure, was considered by the writer as a reliable criterion for placing the genera involved in a group taxonomically equal to that of the true Noctuidae. Both groups might be considered as subfamilies or families, the designation not mattering in so far as they are placed on the same taxonomic niveau. Indeed, we have to deal with sister-groups, of which the Agaristids are apomorphic, the Noctuids plesiomorphic. The complex belongs to the taxon Noctuiformes, the composition of which has been dealt with elsewhere, and need not to be described here.

The origin of the Agaristids should be sought somewhere in the eastern Palaearctic region of to-day, probably in an early period of the Caenozoic, long before the differentiation in a Palaearctic and an Indo-Australian or Oriental faunistic region. We have to admit a primary palaeotropical expansion, with a radiation in the direction of the New World. There still is an affinity between the chinese *Syrania* and the nearctic complex of *Alypia*, the latter probably being the ancestral group of the American Agaristid genera. A somewhat later radiation must have occurred westwards from the cradle-region, producing the Ethiopian and the Madagascan Agaristid faunas. The Agaristidae not being a group of Gondwanian origin, the South African genera (as well as the Neotropical and the Australo-Oceanian ones) should be considered as the more recent.

The existence of several distinct Agaristid faunas (genera common to two or more faunas are but very few, and should be considered as belonging to an older, or more plesiomorphic branch of each fauna) allows us to propose a peculiar kind of taxonomic arrangement, not based on morphological but on spatial or chorological

criteria. The writer had formerly used the space-criterion for two other groups of moths (the Notodontidae and the Thaumetopoeidae) and feels justified in proposing an arrangement of the same kind for the Agaristidae. It should be understood that the Agaristidae being morphologically a very homogenous group, no reliable morphological features can be used for the separation of the faunistic groups. Differences on a generic niveau can of course be noted, and there is, on the other hand, a parallel development in some regions towards sound-producing forms. The necessary details will be given in the introduction to each of the three main faunas. Generally speaking, however, it was deemed preferable not to attempt a well-nigh impossible arrangement on current cladistic lines, i. e. a succession of sister-groups, one plesiomorphic, the other apomorphic, and to resort to a differentiation on purely zoogeographical grounds, as stated above. As the writer had repeatedly pointed out in various publications, it is his conviction that the space or distributional factor should be considered as a differentiating or taxonomic character even, and in many instances more significant than the holomorphic characters generally used.

Of the groups recognised here, the Ethiopian (with its subdivision the Madagascan) fauna does possess the highest percentage of autochthonous apomorphic genera. The Oriental fauna has developed but a small number of apomorphic genera, including *Episteme* and a few sound-producing forms, besides a number of surprisingly homogenous insular genera. Unlike in the family Notodontidae, there is not a distinct, apomorphic Australian faunistic group, and Australian genera hardly differ from those of the continental and insular East Indies. Although seemingly older than the peripheric Old World groups, the American fauna shows very little apomorphies. The Nearctic genera are few and very much akin the Palaearctic ones; the somewhat aberrant genus generally known as *Euthisanotia* has proved to be heterogenous; and the Nearctic genera have remained surprisingly conservative. Being based on zoogeographical criteria, the groups recognized here, are of course taxa of a nature differing from that of the units generally used in a classification, which all are of a morphological nature, those used in a conventional-phylogenetic as well in a cladistic arrangement, not to speak of the OTUs used by the pheneticists. The taxonomic units used here are accordingly being termed Chorotaxa as distinguishable from the usual Morphotaxa. The writer does not know whether the chorotaxa-concept can be applied to all groups of animals, but it does seem to him that to try and find that out is worth while. In this revision the three following Chorotaxa are recognized, viz.:

1. Agaristinae: Palaearctic-Oriental
2. Heracliinae: Ethiopian-Madagascan
3. Alypiinae: Nearctic-Neotropic

Particulars about each group will be given in the respective parts of the revision.

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## LEPIDOPTERA NOCTUIFORMES

### Superfamilia NOCTUOIDEA

#### Familia **Agaristidae**

- 1833 *Agaristidae* BOISDUVAL, (*Agaristides*) Faun. Entomol. Madagascar: 70; Ann. Mus. Paris, 2:218.  
 1840 *Agaristites* BLANCHARD, (*Agaristes* in the next column), Hist. Nat. Ins., 3: 471.  
 1912 *Agaristinae* STRAND in Lepidopt. Cat., 5: 3.  
 1920 *Phalaenoididae* HAMPSON, Cat. Lepidopt. Phal. Brit. Mus., Suppl. 2: 534.

**D i a g n o s i s**: Proboscis well developed; palpi mostly well developed, upturned, the third joint usually naked and porrect; frons with a rounded or conical prominence or process; antennae typically filiform and more or less distinctly dilated distally, before the extremity, but in a number of genera not dilated, ciliated or even pectinate; ocelli present; eyes sometimes hairy. Tympanic organs present, of the noctuid type, but apomorphic in the presence, at the base of the abdomen, of a more or less well developed paired vesicle (*Bulla abdominalis*). Tibiae rarely spined; hind tibiae with two pair generally well developed spurs. Wings relatively broad, with the fore wings rarely produced apically, and bearing sometimes in male a sound producing apparatus of ribbed membrane. Nervation: in the fore wings, first and second anals (1 and 1a) separate, third anal absent; vein 5 from or close to angle of cell; an areole present in nearly all genera. Hind wings with the first anal present, the third anal absent, vein 5 generally obsolescent, from the middle or near the middle of the discocellulars; veins 6, 7 from the upper angle of cell, rarely stalked; vein 8 free at the base, then bent downwards to anastomose with the cell at a point only, very rarely to beyond middle (*Pseudospiris*).

For most of the species, the early stages are unknown. The known larvae have all the prolegs present; an enlarged eleventh segment; tubercles as in the family Noctuidae, low, conoidal, smooth, each bearing a single hair. The pupa naked.

The following species described as *Agaristidae* have not been included in part one of the present monograph:

- Cnissocnema neuhausi* BRYK, Arch. Naturgesch., 79 A(6): 124–126, 1913.  
*Depalpata mirabilis* ROTHSCILD, Ann. Mag. Nat. Hist. (9) 3: 488, 1919. Both belong to the Geometridae.  
*Paraegocera variata* CANDEZE, Encycl. Entomol., B. IV, Lépidopt., 2: 79 (1927).

The single male described and said to be in the collection of the University of Liège could not be located there and should be considered as lost. It most certainly does not belong to the Ethiopian genus *Paraegocera* HAMPSON, and his taxonomic position cannot be determined with certainty.

## I. Palearctic and Oriental Genera

The rather homogenous group of Palearctic-Oriental Agaristidae can be divided into two complexes, the one containing the single genus *Episteme* HÜBNER, the other the remaining genera. *Episteme* is distinguished by several characters. Its species have a large, well-developed, rather elaborate, roughly V-shaped sternal plate of the VIIIth urite, while the other Agaristid genera have that structure rather poorly differentiated; the uncus is relatively very small and lanceshaped, not approximated by the corresponding structure in the remaining genera; a third distinctive feature is the vertical position of the harpe, mostly extending beyond the costal margin of the valva, and not placed in the axis of the latter as in the other Agaristidae.

It is not yet possible to say whether both groups are to be placed on the same taxonomic level. *Episteme* is possibly a younger branch that has split off somewhere in South-east Asia, and is undoubtedly monophyletic. As we shall see, the other group is composed of a number of subgroups some of which are apomorphic, others not, so that it is not certain whether it is monophyletic.

According to the structure of the male genitalia, the members of the said second group fall into several subgroups, mostly not sharply differentiated, but sufficiently to be recognizable. Some subgroups consist of but a single genus (subgroups VII, VIII, IX, X, XI) with a more restricted geographical distribution. Others, such as subgroups III and VI are on the contrary composed of several genera, subgroup III being very widely distributed, being met with from North China and Japan to Australia; subgroup VI is somewhat more restricted, occurring from Indonesia to Tasmania.

The following subgroups are recognized.

### Group A.

**S u b g r o u p I.** Uncus short, more or less elliptical. Tubus analis short. Valva very broad basally, then narrower, truncate terminally; harpe robust but short, placed at a right angle with the axis of the valva. Aedeagus short, rather slender. Sternal plate of the VIIIth urite large, U- or V-shaped. *Episteme* HÜBNER (China to the Philippine Islands, Java, Borneo).

### Group B.

**S u b g r o u p II.** Uncus and tubus analis short. Valva variable, broad basally, or with costa and sacculus nearly parallel; harpe very short. Aedeagus with a patch of cornuti terminally; fultura inferior broad, well developed. *Asteropetes* HAMPSON, *Chelonomorpha* MOTSCHULSKY, *Maikona* MATSUMURA (Japan to North India).

**S u b g r o u p III.** Uncus very long and narrow, frequently longer than the valva. Tubus analis long and narrow. Valva narrow proximally, then broad; harpe short. Aedeagus mostly short, sometimes with a long, very slender terminal process.

(a) Aedeagus without process. *Exsula* JORDAN (India-Burma), *Philippodamias* CLENCH (the Philippine Islands), *Scrobiger* JORDAN (China to the Philippine Islands and Indonesia), *Fleta* JORDAN (Indonesia), *Longicella* JORDAN (Malaya, Indonesia), *Mimeusemia* BUTLER (China and Japan to Australia), *Immetalia* JORDAN (Indonesia to New Guinea and the Solomons).

(b) Aedeagus with process. *Ophthalmis* HÜBNER (Central China to New Guinea, the Solomons, the Bismarck Archipelago, the Philippine Islands), *Crinala* JORDAN (the Philippine Islands), *Damias* WALKER (New Guinea, the Solomons, Australia), *Cruria* JORDAN (New Guinea, Australia).

S u b g r o u p IV. Uncus moderate or short, narrow. Tubus analis moderate or long. Valva elongate; harpe short to very long. Aedeagus rather slender, sometimes with a long terminal process.

(a) Harpe short; aedeagus without process. *Cruriopsis* JORDAN (China to India), *Comocrus* JORDAN (Australia).

(b) Harpe very long; aedeagus with a long filiform process. *Crinocula* JORDAN (Borneo).

S u b g r o u p V. Uncus moderate, hooked. Tubus analis short. Valva elongate, banana-shaped, with a terminal fringe of spinules; harpe moderate. Aedeagus slender, variously armed; fultura inferior rather narrow. *Saigonita* KIRIAKOFF (Indo-China), *Ipanica* HAMPSON (New Guinea, Australia), *Hecatesia* BOISDUVAL (Australia).

S u b g r o u p VI. Uncus variable, short to moderately long, but always slender. Tubus analis elongate. Valva narrow to moderately broad, with a terminal fringe of spinules; harpe variable. Aedeagus slender to nearly filiform, mostly with cornuti, sometimes much broadened basally. *Argyrolepidia* HAMPSON (Indonesia to New Guinea and Australia), *Phalaenoides* LEWIN (New Guinea to Australia), *Agarista* LEACH (New Guinea to Australia), *Apina* WALKER, *Eutrichopidia* HAMPSON and *Periscepta* TURNER (Australia), *Agaristodes* HAMPSON (Tasmania).

S u b g r o u p VII. Uncus moderately slender. Tubus analis very broad. Valva elongate, narrowed proximally and terminally, without fringe of spinules; harpe slender, rather long. Aedeagus moderate, with minute terminal cornuti; fultura inferior shaped as an inverted V. *Pimprana* MOORE (India).

S u b g r o u p VIII. Uncus moderate, slender distally. Tubus analis rather narrow. Valva scimitar-shaped, with a long fringe of spinules; harpe very small, conical. Aedeagus slender, with a subterminal patch of cornuti. *Syfanis* OBERTHÜR (China).

S u b g r o u p IX. Uncus short, moderately slender, hooked. Tubus analis short and narrow. Valva narrow, with the costa and the sacculus parallel; no fringe of spinules; harpe very short. Aedeagus large and robust, with a small terminal patch of cornuti. *Aegocera* LATREILLE (India).

S u b g r o u p X. Uncus very small, lance-shaped. Tubus analis very short. Valva moderately long, rather broad, with the costa and the sacculus more or less parallel, and without spinules; harpe very small, triangular. Aedeagus as long as the valva, rather slender, arched, with a terminal series of cornuti; fultura inferior very elongate. *Platagarista* MEYRICK (Australia).

S u b g r o u p XI. Uncus small, slender. Tubus analis weak. Valva banana-shaped, without fringe of spinules; harpe very proximal, short, sickle-shaped. Aedeagus rather long, moderately robust, unarmed. *Radinocera* HAMPSON (Australia).

**S u b g r o u p XII.** Uncus rather short to moderate, slender. Tubus analis short and broad. Valva banana-shaped, sometimes broadened distally; termen with a fringe of spinules; harpe somewhat variable, short to moderate, arched or nearly straight. Aedeagus very large, moderately robust to robust, variously armed with cornuti. *Coenotoca* TURNER, *Periopta* TURNER, *Idalima* TURNER (all Australia).

**S u b g r o u p XIII.** Uncus moderate, rather slender. Tubus analis short. Valva banana-shaped, with very few (4–5) terminal spinules; harpe short to moderate. Aedeagus moderately robust to robust, with a terminal patch of cornuti *Sarbanissa* WALKER (China and Korea to Java and Borneo), *Zalissa* WALKER (New Guinea, Australia).

It is of course impossible to consider all the above subgroups as phyletic entities, there being nothing known about their origin and their evolution, not to speak of the possible so-called parallelisms between the genera implied. However, considering the parameters other than the male genitalia, there certainly are many affinities between the members of the subgroups. On the other hand, male genitalia of the Lepidoptera are highly complicated and elaborate structures, probably with a complicated genetic background, so that possible 'parallelisms' and 'convergences' should not be given too much prominence, especially when the space-parameter makes more probable some nearer phyletic relations between the various genera.

The author believes that the classification proposed here, even though imperfect reflects the possible evolution of the faunas somewhat better than the rather primitive existant ones.

#### Artificial key to the genera

1	Antennae more or less dilated in the distal section . . . . .	2
1'	Antennae filiform, ciliate or bipectinate, not dilated distally . . . . .	26
2	Fore wings without an areole . . . . .	3
2'	Fore wings with an areole . . . . .	4
3	Palpi with the last joint long, naked; fore wings with the median vein normal . . . . .	<i>Episteme</i> , p. 8
3'	Palpi with the last joint short, hidden; fore wings with the median vein more or less dilated, ribbed . . . . .	<i>Saigonita</i> , p. 98
4	Fore wings with veins 9, 10 anastomosing with vein 8 to form an areole . . . . .	5
4'	Fore wings with vein 9 arising from vein 10, anastomosing with vein 8 to form the areole . . . . .	15
5	Hind tibiae fringed with rough hair above . . . . .	6
5'	Hind tibiae smoothly scaled . . . . .	7
6	Palpi with the last joint long, naked; abdomen clothed dorsally with rough hair . . . . .	<i>Comocrus</i> , p. 94
6'	Palpi with the last joint minute, nearly naked; abdomen smoothly scaled dorsally . . . . .	<i>Crinala</i> , p. 77
7	Frons with a truncate prominence with raised rim at the extremity . . . . .	8
7'	Frons with a rounded prominence . . . . .	9
8	Eyes hairy . . . . .	<i>Chelonomorpha</i> , p. 24
8'	Eyes smooth . . . . .	<i>Cruria</i> , p. 86
9	Eyes hairy . . . . .	10
9'	Eyes smooth . . . . .	11
10	Fore wings with vein 2 from towards the cell-angle . . . . .	<i>Crinocula</i> , p. 96
10'	Fore wings with vein 2 from long before the cell-angle . . . . .	<i>Exsula</i> , p. 29
11	Fore wings with vein 3 from close to the cell-angle . . . . .	12

11'	Fore wings with vein 3 from well before the cell-angle	<i>Scrobigera</i> , p. 34
12	Fore wings with vein 2 from towards the cell-angle	13
12'	Fore wings with vein 2 from long before the cell-angle	<i>Damias</i> , p. 79
13	Palpi fringed with long hair in front	14
13'	Palpi smoothly scaled	<i>Immetalia</i> , p. 60
14	Fore wings with veins 8+9, 10 from a point, at the tip of the areole	<i>Fleta</i> , p. 42
14'	Fore wings with veins 8+9, 10 on a long stalk	<i>Philippodamias</i> , p. 33
15	Eyes hairy	<i>Eutrichopidia</i> , p. 127
15'	Eyes smooth	16
16	Hind tibiae spined	<i>Syfanía</i> , p. 134
16'	Hind tibiae not spined	17
17	Abdomen with dorsal crests on the basal urites	18
17'	Abdomen without basal crests except sometimes on the first urite	21
18	Frons with a somewhat triangular pointed prominence	<i>Asteropetes</i> , p. 22
18'	Frons with truncate conical prominence with a raised rim at the extremity	19
19	Palpi with the second joint clothed with long hair at the extremity	<i>Aegocera</i> , p. 137
19'	Palpi with the second joint evenly fringed with hair in front	20
20	Abdomen with long lateral tufts of hair on the terminal urites	<i>Hecatesia</i> , p. 101
20'	Abdomen without lateral tufts on the terminal urites	<i>Mimeusemia</i> , p. 47
21	Frons with a truncate rounded prominence with a raised rim at the extremity	22
21'	Frons with a rounded or somewhat pointed prominence	24
22	Hind tibiae fringed with rough hair above	<i>Phalaenoides</i> , p. 119
22'	Hind tibiae smoothly scaled	23
23	Hind tibiae dilated; fore and hind wings with streaks of ribbed membrane	
		<i>Platagarista</i> , p. 140
23'	Hind tibiae normal; wings without streaks of ribbed membrane	<i>Agarista</i> , p. 122
24	Pectus, femora and abdomen clothed with long hair	<i>Argyrolepidia</i> , p. 104
24'	Pectus, femora and abdomen nearly smoothly scaled	25
25	Both wings with vein 3 from close of the cell-angle	<i>Ophthalmis</i> , p. 68
25'	Both wings with vein 3 from well before cell-angle	<i>Longicella</i> , p. 44
26	Frons with a rounded prominence with a shovel-shaped process at middle, and a corneous plate below it	27
26'	Frons with the prominence not shovel-shaped and mostly without corneous plate below it	28
27	Eyes small, reniform	<i>Apina</i> , p. 125
27'	Eyes large, round	<i>Ipanica</i> , p. 99
28	Frontal prominence truncate conical with raised edges	29
28'	Frontal prominence pointed or rounded	36
29	Abdomen without dorsal crests	30
29'	Abdomen with one or more dorsal crests	32
30	Antennae with ciliae and setae; palpi very hairy, porrect	<i>Pimprana</i> , p. 132
30'	Antennae simple or with ciliae only	31
31	Antennae simple; palpi shorter than the eye is broad; fore and hind wings with vein 2 from near the cell-angle	<i>Periscepta</i> , p. 130
31'	Antennae ciliate; palpi rather long; fore and hind wings with vein 2 from well before angle	<i>Idalima</i> , p. 150
32	Abdomen with several dorsal crests	33
32'	Abdomen with a basal crest only	34
33	Antennae simple	<i>Periopta</i> , p. 147
33'	Antennae ciliate	<i>Sarbanissa</i> , p. 154
34	Antennae filiform; last palpal joint dilated at the extremity	<i>Sarbissa</i> , p. 152
34'	Antennae bipectinate, serrate or ciliate; last palpal joint not dilated at the extremity	35
35	Antennae bipectinate in male, serrate in female; fore wings with veins 3, 4, 5 well separated; vein 6 from below the cell-angle	<i>Agaristodes</i> , p. 128
35'	Antennae ciliate; fore wings with veins 3, 4, 5 approximated; vein 6 from the lower cell-angle	<i>Radinocera</i> , p. 142
36	Frons with a pointed prominence	37
36'	Frons with a rounded prominence	<i>Zalissa</i> , p. 168
37	Abdomen with several dorsal crests	<i>Coenotoca</i> , p. 144
37'	Abdomen with a basal crest only	<i>Maikona</i> , p. 27

Genus *Episteme* HÜBNER

(fig. 1)

1820 *Episteme* HÜBNER, Verz. (12): 180. — *Species typica*: *Noctua lectrix* LINNAEUS (by monotypy).

1825 *Eusemia* DALMANN (syn. fide KIRBY 1892), Mon. Castniae: 26. — *Species typica*: *Noctua lectrix* LINNAEUS.

**D i a g n o s i s**: Proboscis fully developed; eyes naked; palpi upturned, the 2nd joint fringed with long hair in front, the 3rd joint long, naked, porrect; frons with truncate prominence, with raised rim in front; antennae distally dilated towards apex; legs with smooth scaling; hind tibiae with two pairs of spurs. Wing venation: in the fore wing; vein 2 from about 5/7 of cell; 3, 4, 5 about equidistant, approximated; discocellulars strongly incurved; 7, 8, 9, 10 stalked; areole absent; 11 from cell. In the hind wing, vein 2 from 3/4 of cell; 3, 4 from angle of cell; 5 obsolescent, from middle of cell; 6, 7 short stalked or from angle of cell; 8 anastomosing with

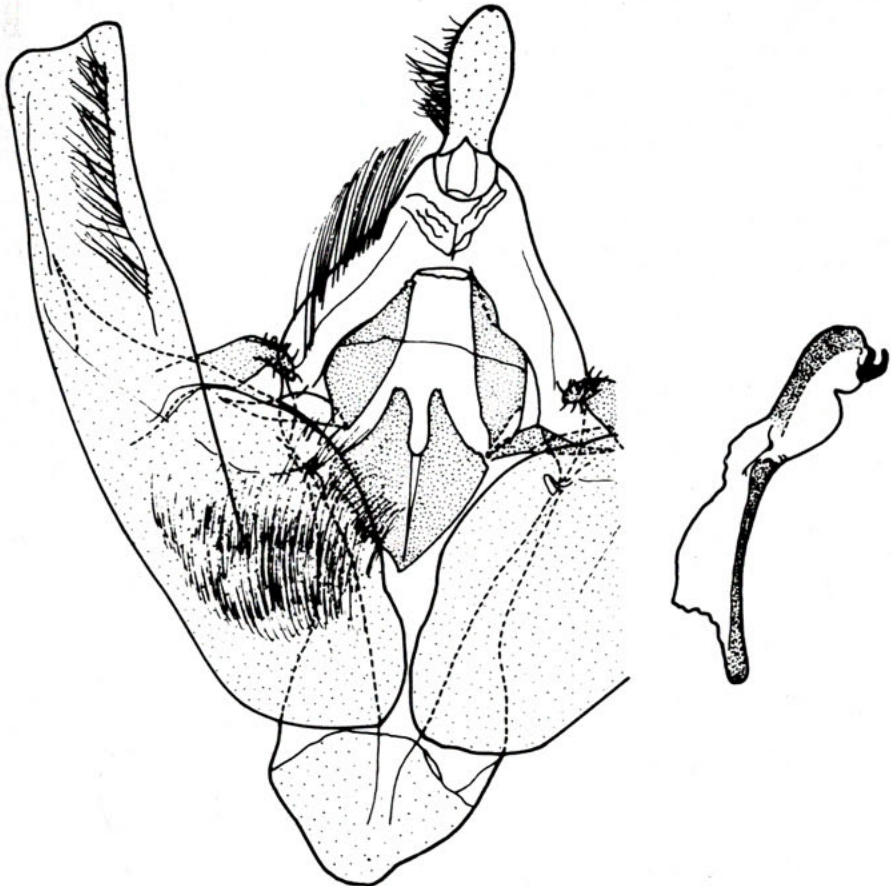


Fig. 1. *Episteme lectrix* L. B. M. Noct. 8468

the cell at a very short distance from the base. Male genitalia: Uncus rather short, lance-shaped; vinculum narrow, with the sides fused distally; the usual bunches of stiff hair absent. Valva elongate, very broad proximally, narrowing beyond the middle; apex blunt; harpe placed subcostally, short, curved, sometimes broadened terminally; fultura inferior oval, with a deep notch at middle of the distal margin. Saccus broad and short, roughly triangular. Sternal plate of the eighth urite large, U-shaped, fringed with hair.

Distribution: China, India, Indochina, Indonesia.

#### Key to the species

- |     |  |                               |
|-----|--|-------------------------------|
| 1   | Hind wings orange or red . . . . .   | 2                             |
| 1'  | Hind wings black, usually with red or orange spots near the anal angle . . . . .   | 15                            |
| 2   | Tegulae without yellow spots . . . . .   | 3                             |
| 2'  | Tegulae with yellow spots . . . . .  | 11                            |
| 3   | Collar and tegulae dotted with yellow . . . . .  | <i>E. connexa</i> , p. 10     |
| 3'  | Collar and tegulae dotted with white . . . . .   | 4                             |
| 4   | Terminal band of hind wings excised and narrow in apical area . . . . .  | 5                             |
| 4'  | Terminal band of hind wings broadening in apical area . . . . .  | 10                            |
| 5   | Hind wings without subterminal spots . . . . .   | 9                             |
| 5'  | Hind wings with more or less developed subterminal spots . . . . .   | 6                             |
| 6   | Subterminal series of spots in fore wings yellow . . . . .   | 7                             |
| 6'  | Subterminal series of spots in fore wings white . . . . .  | 8                             |
| 7   | Fore wings with two subbasal blue lines; hind wings with the black markings less developed . . . . .                             | <i>E. hebe</i> , p. 12        |
| 7'  | Fore wings without subbasal blue lines; hind wings with the black markings well developed . . . . .                              | <i>E. vetula</i> , p. 10      |
| 8   | Abdomen with the VIIIth ring wholly black . . . . .  | <i>E. darocana</i> , p. 13    |
| 8'  | Abdomen with the VIIIth ring black above, yellow laterally . . . . .   | <i>E. mundina</i> , p. 12     |
| 9   | In the fore wings blue basal spots small; proximal band very much reduced . . . . .  | <i>E. conspicua</i> , p. 13   |
| 9'  | In the fore wings blue basal spots conspicuous; proximal band well developed, of two spots . . . . .                             | <i>E. sumatrana</i> , p. 13   |
| 10  | Fore wings with elongate white postmedial spots; subterminal spots absent . . . . .  | <i>E. bisma</i> , p. 14       |
| 10' | Fore wings with 1-2 yellow spots beyond the cell; subterminal series present . . . . .   | <i>E. latimargo</i> , p. 14   |
| 11  | Hind wings with the black terminal band not expanding between veins 2 and 4 . . . . .  | 12                            |
| 11' | Hind wings with the black terminal band expanding between veins 2 and 4 . . . . .  | <i>E. lectrix</i> , p. 16     |
| 12  | Fore wings with a series of terminal blue spots . . . . .  | <i>E. distincta</i> , p. 17   |
| 12' | Fore wings without a series of terminal blue spots . . . . .   | 13                            |
| 13  | Anal tuft with the extremity black . . . . .   | <i>E. nipalensis</i> , p. 15  |
| 13' | Anal tuft with the extremity orange . . . . .  | 14                            |
| 14  | Fore wings with yellow spots; antemedial cell-spot white; pilosity of middle and hind tibiae black . . . . .                     | <i>E. maculatrix</i> , p. 19  |
| 14' | Fore wings with white or yellowish-white spots; antemedial cell-spot yellow; pilosity of middle and hind tibiae yellow . . . . . | <i>E. beatrix</i> , p. 22     |
| 15  | Fore wings with the subterminal series of spots curved . . . . .   | 16                            |
| 15' | Fore wings with a subterminal series of obliquely placed white spots . . . . .   | <i>E. negrita</i> , p. 19     |
| 16  | Abdomen with dorsal orange bands; hind wings with 2 orange spots above anal angle . . . . .                                      | <i>E. adulatrix</i> , p. 20   |
| 16' | Abdomen without orange dorsal bands . . . . .  | 17                            |
| 17  | Both wings with the white spots dentate towards the costa; hind wings with 2 orange spots above anal angle . . . . .             | <i>E. sumbana</i> , p. 21     |
| 17' | Both wings with the white spots punctiform towards the costa; hind wings with an orange point below vein 2 . . . . .             | <i>E. nigripennis</i> , p. 20 |

**Episteme connexa (WALKER)**

- 1856 *Eusemia connexa* WALKER, List Lepidopt. Het. Brit. Mus., 7:1773. – *Terra typica*: East Java (Type, ♂, ♀, in British Museum).  
 1892 *Episteme connexa* – KIRBY, Syn. Cat. Lepidopt. Het.: 27.

**D i a g n o s i s**: Head and thorax black; first joint of the antennae pale yellow; 1st and 2nd joints of palpi and sides of frons spotted with pale yellow; collar and tegulae with pale yellow patches; pectus with pale yellow pilosity; fore coxae yellow in front; abdomen orange, banded with bright yellow; fore wings black with yellow markings, viz. a dot below the base of costa; an antemedial cellspot; an oblique bar across middle of cell; a spot below the base of vein 2; oblique spots at both angles of cell; a curved subterminal series of small spots; and a large spot above tornus. Hind wings bright orange; base black; costa black, expanding into a spot at the upper cell-angle; a large spot beyond lower cell-angle, connected with the anal margin by an irregular band; a marginal band wide at costa, less so above vein 5, then sinuous and ending in a point at anal angle, usually with a small yellow spot on it below apex. Length of fore wing 22 mm in male, 25 in female.

**D i s t r i b u t i o n**: East Java.

**Episteme vetula (GEYER)**

- 1832 *Heraclia vetula* GEYER, Zutr. Exot. Schmetterl., 4:17; fig. 657, 658. – *Terra typica*: Java (Type not designated).  
 1874 *Eusemia vetula* – BOISDUVAL, Rev. Mag. Zool. Paris, (3) 2:82.

**D i a g n o s i s**: Head and thorax black; first joint of antennae white; tips of the 1st and the 2nd joints of palpi, sides of frons, a postocular streak, collar and tegulae spotted with white; abdomen orange with black bands. Fore wings black; markings pale orange or buff; a spot in middle of cell, conjoined to a spot below cell; an oblique irregular band from below costa just beyond the cell to vein 2, sometimes interrupted in discal fold, where it is bent outwards or reduced to small spots; a subterminal series of dentate spots between veins 2 and 8, and 2 others above dorsum; bluish-white subcostal marks near the base and before middle. Hind wings orange red; base black; costal area black, expanding into a spot at upper angle of cell; a large black spot beyond lower cell-angle, connected with the anal margin by an irregular band, and with the terminal band by a streak on vein 2; terminal band expanding on costa and less so above vein 5, sinuous and ending in a point at the anal angle, with a few spots on it, the largest above vein 6. Length of fore wing 30 – 33 mm.

**D i s t r i b u t i o n**: Assam and Burma to Indonesia and Palawan.

**Episteme vetula vetula (GEYER)**

- 1832 *Heraclia vetula* GEYER, Zutr. Exot. Schmetterl., 4:17; fig. 657–638 (Type not designated). – *Terra typica*: Java.  
 1912 *Episteme vetula vetula* – JORDAN in SEITZ, Großschmetterl. Erde, 9:3; pl. 1c.

**D i s t r i b u t i o n**: Western Java.

*Episteme vetula irenea* (BOISDUVAL)

- 1874 *Eusemia irenea* BOISDUVAL, Rev. Mag. Zool., Paris, (3) 2:84. — Terra typica: Timor or Sumatra (Type in British Museum).  
 1892 *Episteme irenea* — KIRBY, Syn. Cat. Lepidopt. Het.: 27.  
 1912 *Eusemia maculatrix* — STRAND (nec WESTWOOD 1841), Lepidopt. Cat., 5:5.  
 1912 *Eusemia vetula irenea* — JORDAN in SEITZ, Großschmetterl. Erde, 9:3; pl. 1c.

**Diagnosis:** Fore wings with the subterminal series of spots white; hind wings yellow; spots on the marginal band often confluent.

**Distribution:** Sumatra, Nias.

*Episteme vetula fasciatrix* (WESTWOOD)

- 1848 *Eusemia fasciatrix* WESTWOOD, Cab. Or. Entomol.: 67. — Terra typica: Assam (Type in British Museum).  
 1892 *Episteme fasciatrix* — KIRBY, Syn. Cat. Lepidopt. Het.: 27.  
 1901 *Eusemia vetula* subsp. *fasciatrix* — HAMPSON, Cat. Lepidopt. Phal. Brit. Mus., 3:522.  
 1875 *Eusemia communis* BUTLER, Ann. Mag. nat. Hist., London, (4) 15:140; tab. 13, fig. 1. — Terra typica: Assam (Type, ♂, ♀, in British Museum).  
 1892 *Episteme communis* — KIRBY, Syn. Cat. Lepidopt. Het.: 27.  
 1901 *Eusemia vetula* subsp. *communis* HAMPSON, Cat. Lepidopt. Phal. Brit. Mus., 3:522. —  
 1912 *Eusemia vetula fasciatrix* forma *communis* JORDAN in SEITZ, Großschmetterl. Erde, 9:3; pl. 1b. —

**Diagnosis:** Fore wings with both series of spots mostly narrower than in *E. irenea*, last spot of the antemedial series shorter and placed more distally; sometimes the spots are white (= *communis*).

**Distribution:** Assam, Burma; in Malaya (Penang) transition zone to *E. v. irenea*.

*Episteme vetula communicans* (WALKER)

- 1864 *Eusemia communicans* WALKER, List Lepidopt. Het. Brit. Mus., 31:50. — Terra typica: Cambodia (Type, ♀, in British Museum).  
 1892 *Episteme communicans* — KIRBY, Syn. Cat. Lepidopt. Het.: 27.  
 1901 *Eusemia vetula* subsp. *fasciatrix* HAMPSON, Cat. Lepidopt. Phal. Brit. Mus., 3:522. — Terra typica: Assam (Type in British Museum).  
 1912 *Eusemia vetula communicans* — JORDAN in SEITZ, Großschmetterl. Erde, 9:3.

**Diagnosis:** A somewhat doubtful form; transitional between *E. v. communicans* and *E. v. bijugata*.

**Distribution:** Cambodia.

*Episteme vetula bijugata* (WALKER)

- 1862 *Eusemia bijugata* WALKER, J. Linn. Soc. London, Zool., 6:85. — Terra typica: Borneo (Type in British Museum).  
 1892 *Episteme fasciatrix* — KIRBY, Syn. Cat. Lepidopt. Het.: 27.

- 1902 *Eusemia sollicita* SWINHOE, Ann. Mag. Nat. Hist., London, (7) 10:495-496. — *Terra typica*: Borneo (Type, ♂, in British Museum).  
 1912 *Eusemia vetula bijugata* — JORDAN in SEITZ, Großschmetterl. Erde, 9:3; pl. 1 b.

**Diagnosis:** Fore wings with the band continuous; distal band generally distinctly broader than the proximal; submarginal spots reduced or absent.

**Distribution:** Borneo.

#### *Episteme vetula palavanica* (JORDAN)

- 1912 *Eusemia vetula palavanica* JORDAN in SEITZ, Großschmetterl. Erde, 9:3. — *Terra typica*: Philippine Islands, Palawan (Type, ♂, in British Museum).

**Diagnosis:** Fore wings with the bands continuous, but the distal band narrower than the proximal one; submarginal series well developed; tornus with a yellow spot.

**Early stages** (1905 PIEPERS, Tijdschr. Ent. 's Gravenhage, 48:195; pl. 7, fig. 6. Larva: greyish of varying intensity, darker below, with longitudinal black stripes; head, prothoracic ring, a large dorsal spot on the XIth ring and a spot above the anal legs orange.

**Distribution:** Philippine Isles: Palawan.

#### *Episteme hebe* (JORDAN)

- 1912 *Eusemia hebe* JORDAN in SEITZ, Großschmetterl. Erde, 9:3; pl. 4a. — *Terra typica*: Java (Type, ♂, in British Museum).

**Diagnosis:** Differing from *E. vetula* as follows. Coxae with pilosity yellow; mesothorax above with 2 lateral yellowish grey spots; metathorax above with yellowish grey lateral pilosity. Fore wings with 2 bluish lines between base and the proximal spots; submarginal spots better developed, especially the spot above tornus. Hind wings with the black markings less developed, with the transversal band shorter and the terminal band narrower.

**Distribution:** East and West Java.

#### *Episteme mundina* (JORDAN)

- 1912 *Eusemia mundina* JORDAN in SEITZ, Großschmetterl. Erde, 9:3, pl. 4a. — *Terra typica*: Perak, Mt. Tahan (Type, ♂, in British Museum).

**Diagnosis:** Near *E. vetula irenea*, but larger. White spots on head and thorax smaller; coxae with yellow pubescence; abdomen yellow below, unspotted or with black dots on the edge of some segments; upperside of the abdomen with the first ring broadly margined with yellow, the second with an interrupted yellow edging. Fore wings with a subbasal yellow cell-spot and two oblique broken bands, the distal