H. Sauter's Formosa-Ausbeute. Nycteribiidae.

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In the Transactions of the Entomological Society of London for 1908 (pp. 359—368 and Plate 18) I reported on a small series of Nycteribiidae from the island of Formosa, which had been received from the collector Herr Hans Sauter. I did not then know that this material was only a small sample of Herr Sauter's collection of these insects. But such was the case, and in 1912 at the request of Dr. Walther Horn I undertook to examine the whole of Sauter's Formosan Nycteribiid material in the possession of the Deutsches Entomologisches Museum. The collection consisted of over 100 glass tubes, most of which contained several, and some a large number, of specimens preserved in alcohol, together with over 90 dried specimens.

The small series reported on in 1908 contained three species: *Penicillidia jenynsi*, the ♂ of which was described long ago by Westwood, while the ♀ was then described and figured by me for the first time: and two other species, described as new under the names *Nycteribia* (*Listropodia*) *insolita* and *Nycteribia* (*Listropodia*) *sauteri*. The large collection which has now been examined contains great numbers of these three species, together with smaller numbers of two others (*Penicillidia dufouri* (Westwood) and *Nycteribia* (*Listropodia*) *pedicularia* Latreille), making 5 species in all.

The two species described as new in 1908 have now proved to be identical with two described in 1901 by Speiser from Sumatra. Thus *N. insolita* Scott becomes a synonym of *N. allotopa* Speiser, and *N. sauteri* Scott of *N. parvula* Speiser. It is unfortunate that synonymy is thus increased, but Speiser's descriptions were incomplete and consequently I did not recognise the material before me as identical with his species. Both his species were described only from dried specimens; in the case of *N. allotopa* only the ventral surface was described, and in that of *parvula* only one sex (♀) was described, and in neither case were figures given. I was further misled by the fact that when I submitted specimens to Dr. Speiser he himself considered both species to be new, which may perhaps have been due to the Formosan material in alcohol appearing very different to the dried original examples. Through the kindness of Dr. R. Gestro of the Museo Civico at Genoa I have now seen the actual types of both species, and the identity of *insolita* with *allotopa* and of *sauteri* with *parvula*

is established beyond doubt: but the more complete descriptions, and the figures, are under the synonyms.

It may be remarked that *Nycteribiidae* are quite unfitted for being preserved dry, the shrinkage that occurs, especially in the ♀, being often so great that essential features become unrecognisable. Only when a large series of a species is obtained may some specimens be mounted dry; in all other cases they should be preserved in alcohol. It would also be well for entomologists to refrain from describing new species from one aspect only — i. e., dorsal or ventral surface alone — and also to refrain as far as possible from describing them from only one sex.

Geographical Distribution. The five species include no novelties, but from a geographical point of view they are very interesting. The following is a summary of their areas of distribution to far as at present known:

Penicillidia dufouri: Europe, North Africa, Formosa.
Penicillidia jenynsi: Ceylon, Sumatra, China, Formosa.
Nycteribia (*Listropodia*) *allotopa*: Ceylon, Sumatra, China, Formosa.
Nycteribia (*Listropodia*) *parvula*: Ceylon, Sumatra, Formosa.
Nycteribia (*Listropodia*) *pedicularia*: Europe, North Africa, South Africa, Formosa.

Thus it appears that, so far as is known, three of the species are Oriental: *Penicillidia dufouri* is principally Palaearctic: and *Nycteribia pedicularia* seems to be very wide-spread, being widely distributed in the Palaearctic Region and also recorded from South Africa. There is perhaps an overlapping of Palaearctic and Oriental forms in Formosa. The island itself lies in the Oriental Region: it is crossed by the Tropic of Cancer, and its lofty mountains give it a variety of tropical and temperate climates. The species of Nycteribiidae herein discussed were not, however, found in separate localities, but specimens of all were found together in the same locality, and almost all the material is from the neighbourhood of two towns — Anping and Tainan — in the one case on, and in the other quite near, the Western Coast. The host-bat of all the Formosan specimens of these species is *Miniopterus schreibersi* Natterer, a species which, *sensu lato*, is very widely-distributed, being known from all the warmer regions of the Old World, and from Australia. The present writer inclines to the belief that many species of Nycteribiidae will prove to be very wide-ranging, which would not be surprising in view of the distributional powers of their hosts.

In the introductory remarks of my earlier paper (op. cit., pp. 359, 360) I noted that Nycteribiidae of different genera and species were found not only on the same bat-species but on the same bat-individual. The examination of Sauter's whole collection shows that this is a perfectly common occurrence, in the case of *Miniopterus schreibersi* at least. This state of things is quite

comprehensible in the light of the following note made by Sauter, which indicates that the bulk of the material was found in an old temple where bats congregate in large numbers. I give the note *verbatim*, as received through Dr. Horn: „Die Tiere dürften wohl alle *Miniopterus schreibersi* als Wirt haben, obwohl ich bei der großen Aufsammlung (in einem alten Tempel) auch von *Myotis taiwanensis* und *Pipistrellus abramus* Nycteribiiden abgelesen habe; die beiden letzteren Arten hingen vereinzelt unter den *Miniopterus*, sodaß die Parasiten bequem von einem Wirt auf den anderen übergehen respektive sich verirren konnten. *Myotis* und *Pipistrellus* sind, wenn einzeln gefangen, meist völlig frei."

In the collection far the most abundant species is *Nycteribia allotopa*, represented by a great number of specimens: next in abundance is *Penicillidia jenynsi*, and third comes *Nycteribia parvula*, both represented by very long series: very much less numerous are *Nycteribia pedicularia*, represented by 44 specimens, and *Penicillidia dufouri*, represented by only 16 specimens.

Variation. Examination of the long series of Formosan material shows that there is some variation in the quantity of bristles on the surfaces of certain of the abdominal plates. In four out of the five species (i. e. in all except *Penicillidia dufouri*) it was found that the 2nd tergite of the ♀ has its surface quite bare in some specimens, but bearing a greater or less number of short bristles in others. Similarly in the ♂ of *Nycteribia allotopa* the 4th tergite has its surface quite bare in some specimens, bearing short bristles in others. Likewise the isolated very long bristles, and short thorn-like bristles, on the hind margins of certain segments may vary in number and position. Thus in *N. parvula* ♀ the very long bristles on the hind margin of the chitinous tergite before the anal segment may be 4 or 6 in number; and in *N. pedicularia* the short thorn-bristles on the hind margin of the 4th sternite vary considerably in number. Therefore, in determinations made from few individuals, too much reliance must not be placed on whether certain tergites are bare or bristly on the surface, or on the exact numbers of thorn-bristles, &c.

In my earlier paper (op. cit., p. 362) I gave some description of a larva of *Penicillidia jenynsi*. In the larger material a number of ♀♀ of more than one species were found carrying larvae in various degrees of extrusion from the abdomen, but time has prevented a detailed examination of these being made. Some specimens of *Penicillidia jenynsi* bear fungi of the order *Laboulbeniaceae*, and a note on the occurrence of these organisms on Nycteribiidae is given under that species.

Note on the numbering of the abdominal tergites. In my descriptions of the ♂ of *N. insolita* and *N. sauteri* (op. cit., pp. 365, 367), the first and second tergites were reckoned together as tergite 1, and the true third tergite was called „tergite 2", and

so on. This procedure was adopted because the true basal tergite is more or less fused with the second, and in many species is in fact scarcely discernible, so that the second tergite often appears to be the first. But in the present paper this method is abandoned, and the true basal tergite is reckoned as tergite 1 (even if not very distinctly separated from the second), the true second as tergite 2, and so on.

Penicillidia, Kolenati.

1. *Penicillidia dufouri* (Westwood).

Nycteribia dufouri Westwood, Trans. Zool. Soc. London, I. 1835, p. 290, pl. 36, figs. 49, 50.
Penicillidia dufouri Kolenati, Horae Soc. ent. Ross., II. 1863, p. 72, tab. XI—XII, fig. 24a—e.
Penicillidia leachi Kolenati, op. cit., p. 75, tab. XII—XIII, fig. 25a—e.
Penicillidia dufouri Speiser, Arch. Naturg., 67. 1. 1901, p. 22.

This species is represented by a series of 9 ♂ and 7 ♀. I can see no distinguishing marks between them and some specimens before me from Eastern Algeria. The principal interest of the series lies in the fact that it demonstrates how wide the range of this species is (as is also the case with the series of *Nycteribia pedicularia* discussed below). It was previously known from many parts of Europe and from North Africa, and now that it is known from Formosa, it will not be surprising if its range is found to include many other localities.

List of the Material from Formosa.

In Spirit: Anping, 26. IX. 1906, 3 ♂ 3 ♀. Tainan, 3. X. 1906, 6 ♂ 1 ♀. Tainan, 7. X. 1906, 2 ♀.
Dried specimen: Tainan, dated X. 1907—9, 1 ♀.

2. *Penicillidia jenynsi* (Westwood).

Nycteribia jenynsi Westwood, ♂, Trans. Zool. Soc. London, I. 1835, p. 291, pl. 36. Figs. 29—34; Kolenati, Horae Soc. Ent. Ross., II. 1863, p. 88.
Penicillidia jenynsi Speiser, ♂, Arch. Naturg., 67. 1. 1901, p. 28.
Penicillidia jenynsi Scott, ♂♀, Trans. Ent. Soc. London, 1908, p. 360, pl. 18, figs. 1—8.

The ♂ of this species was first described by Westwood, and his description was merely quoted by Kolenati, who had not himself seen the species. The ♂ was redescribed by Speiser. In 1908 I studied a few specimens of both sexes collected by Sauter in Formosa. I described and figured the ♀ for the first time, and also gave new figures of the ♂ abdomen and some notes on this sex. Now that the whole of Sauter's material has been submitted to me, there is found to be among it a very large series of both sexes of this species.

There is however but little to add to my former description and figures. The 2nd abdominal tergite of the ♀ was described and figured as quite bare on its surface, and this was correct as far as concerned the material then before me. In many of the ♀♀ contained in the larger material it is also quite bare, but in some it bears extremely short fine bristles on the middle part of the disc near the hind margin; they cover a roughly triangular area with its apex pointing forwards. The 2 oval chitinous plates representing one of the sternites of the ♀ (fig. 4b of my 1908 paper) sometimes have the short stiff erect bristles on their surfaces more numerous and covering almost the whole surface, instead of being found only on its posterior part as in the figure referred to: also the transverse chitinous plate (op. cit., fig. 4c) sometimes has short stiff erect bristles scattered over its surface, and not only near its hind margin. It is just these variations from the form described as the type, which are found strongly developed in two ♀♀ from Ceylon collected by Mr. Fryer.

Among the dried material, 2 ♂ and 1 ♀ have a fungus of the order **Laboulbeniaceae** growing on their abdomens. It appears to to grow chiefly on the pleural region. One ♂ has two fairly large groups in the pleural region of the 2nd and 3rd segments, and other smaller groups on the posterior parts of the abdomen: the other ♂ has a group on the anal segment near the base of one of the claspers, and smaller pieces on the pleural regions of the 3rd and 4th segments. The ♀ has a large group more dorsolaterally placed, just behind the posterior margin of the 2nd tergite, and another dorsolateral group near the base of the anal segment. A ♀ of this same species collected in Ceylon by Mr. Fryer, and preserved in alcohol, also bears two groups of this fungus, one on either side of the abdomen: they are ventrolaterally placed, just posterior to the two oval chitinous plates representing the (?) 4th sternite. Possibly the fungus is more pleural in position in the ♂, owing to the soft connexival membrane being there exposed between the harder tergites and sternites: while in the ♀ abdomen, where expanses of connexivum are exposed both dorsally and ventrally, its position may be less restricted. Be this as it may, in these specimens at any rate the fungus does not seem to be attached to the harder chitinised portions.

The specimens bearing Laboulbeniaceae were submitted to a mycologist, Mr. F. T. Brooks (Demonstrator in Botany in the University of Cambridge). He considers the fungi to be almost certainly identical with the form described by Peyritsch[1]) as *Laboulbenia nycteribiae* (= *Helminthophana nycteribiæ* Thaxter[2]).

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[1]) Sitzb. Ak. Wien, Math.-Naturw., Bd. 64, Abth. 1, 1871, p. 441, Pl. 1.

[2]) Mon. Laboulbeniaceae, Mem. Amer. Ac. Arts and Sci., Vol. xii' No. 3, 1896, pp. 297—8, Pl. 8, Fig. 10.

This species was recorded as found on European examples of *Penicillidia conspicua* Speiser (= *westwoodi* Kolenati), *Nycteribia* (*Acrocholidia*) *vexata* Westwood (= *montaguei* Kolenati), and *Penicillidia dufouri* Westwood). Speiser also records[3]) the finding of Labculbeniaceae on *Cyclopodia macrura* Speiser (New Pomerania), on specimens of *Eucampsipodia hyrtli* Kolenati from Egypt and from Burmah, and on German examples of *Nycteribia blasii* Kolenati. I am not aware that they have ever previously been recorded from *Penicillidia jenynsi*.

Loc. China, Sumatra, Ceylon, Formosa.

P. jenynsi was described from China, and is known from Sumatra. Speiser (op. cit., p. 49) queries an old record from Ceylon, but as stated above I have before me specimens from that island. Its abundance in Formosa — in certain localities at any rate — is proved by the subjoined **list of material:**

In spirit: Tainan, 3. X. 1906, 33 ♂, 46 ♀. Tainan, 6. X. 1906, 49 ♂, 54 ♀, Tainan, 7. X. 1906, 20 ♂, 29 ♀.

Dried specimens: Tainan, dated X. 1906 and X. 1907—9, 12 ♂, 13 ♀ (including 1 pair in Coitu, and 2 ♂ and 1 ♀ bearing fungus).

Nycteribia, Latreille. Subgenus **Listropodia** (Kolenati).

3. *Nycteribia* (*Listropodia*) *allotopa* Speiser.

Nycteribia (*Listropodia*) *allotopa* Speiser, Arch. Naturg., 67. 1. 1901, p. 37.

Nycteribia (*Listropodia*) *insolita* Scott, Trans. Ent. Soc. London, 1908, p. 364, Pl. 18, figs. 9—13.

This species was described by Speiser from 1 ♂ and 1 ♀ from Sumatra, preserved dry in the Museo Civico of Genoa; only the ventral surface was described. Through the kindness of Dr. R. Gestro, it has been possible for me to examine the actual types of *allotopa*, and after close comparison I find that *allotopa* and *insolita* are identical.

The original description under the name *allotopa* was very incomplete, but after examination of the very long series now before me, there is not much to add to the description given under the synonym *insolita*. I described and figured the 4th tergite of the ♂ as quite bare on its surface: it was so in the specimen then before me, and it is so in many others, and it is so also in Speiser's ♂ type of *allotopa*: but in many of the Formosan ♂♂ it bears scattered short bristles on its surface, a very little longer but less dense than those on tergites 2 and 3. Even the ♂ 5th tergite occasionally has one or two short bristles on its surface. The 2nd tergite of the ♀ varies in a similar way. In the type of *allotopa* and in other specimens its surface is quite bare, while in some of the Formosan specimens it is fairly closely covered with short dark bristles from its front

[3]) Arch. Naturg., 67. 1. 1901, p. 20.

to its hind margin, but apparently not near the lateral margins. — The length and narrowness of the ♂ anal segment are characteristic, and when this segment is viewed from the side it is often seen to be curved ventrally. The curvature of the claspers (Speiser, **l. c.,** fig. b; Scott, op. cit., fig. 10) and the dark pigmentation of their apices are also characteristic and constant. In the ♀ the constancy of one characteristic feature throughout the series is noticeable: on the dorsal chitinous plate before the anal segment (Scott, op. cit., fig. 11c), the 4 (or 6) long bristles do not alternate with the short thorn-like bristles on the hind-margin, but stand in a curved row on the surface of the segment some way in front of the hind-margin. This is an unusual arrangement, for in a number of species when short thorn-like bristles and long bristles are present, the two kinds alternate along the hind-margin, several short ones standing between each two long ones (cf. *parvula* ♀, op. cit., fig. 17; &c.). The appearance of the two portions of the ♀ anal segment on either side of the anus varies greatly according to the degree of distension of the abdomen: in gravid ♀♀ they are divergent in position, not parallel as in my fig. 11 (op. cit.).

There are before me a number of specimens of this species from Ceylon, which are decidedly smaller than the Sumatran and Formosan specimens, but which otherwise agree with them closely.

Loc. Sumatra, Ceylon, China, Formosa.

Sumatra: Caves of Lian si Paghe, 1 ♂ 1 ♀ (Museo Civico, Genoa); host unrecorded.

Ceylon: Peradeniya, X. 1911 and I. 1912, from *Miniopterus schreibersi* (J. C. F. Fryer).

China: Amoy, 1 ♂ 1 ♀ from *Miniopterus schreibersi* var. *blepotis*, preserved dry in British Museum.

Formosa: The great abundance of specimens found on *Miniopterus schreibersi* in this island is attested by the following **list of material:**

In spirit: Tainan, 3. X. 1906, 80 ♂, 79 ♀. Tainan, 6. X. 1906, 34 ♂, 52 ♀. Tainan, 7. X. 1906, 41 ♂, 32 ♀. Taihorin, VI. 1911, from an undetermined bat, 3 ♂, 4 ♀.

Dried specimens: Tainan, dated X. 1906 and X. 1907—9, 25 ♂ 25 ♀.

4. *Nycteribia* (*Listropodia*) *parvula* Speiser.

Nycteribia (*Listropodia*) *parvula* Speiser, ♀, Arch. Naturg., 67. 1. 1901, p. 38.

Nycteribia (*Listropodia*) *sauteri* Scott, ♂♀, Trans. Ent. Soc. London, 1908, p. 366, Pl. 18, figs. 14—18.

This species was described by Speiser from 2 ♀ from Sumatra, preserved dry in the Museo Civico of Genoa. As only the one sex was described, without figures, and from dried examples, I unfortunately did not recognise the specimens received from Formosa in 1908 as this species, but described and figured both sexes as

a new species under the name *sauteri*. But after close comparison with the actual type of *parvula*, kindly lent by Dr. R. Gestro, I find that *parvula* and *sauteri* are identical.

In this species the femora and tibiae are not nearly so much broadened as in some species of the subgenus *Listropodia* (see Scott, op. cit., fig. 14 — and cf. fig. 13). The 5th tergite of the ♂, which I figured as quite bare (op. cit., fig. 15), may sometimes have one or two short bristles on its surface. The shortness of the ♂ anal segment, and the shortness and straightness of the claspers, together with their pale colour and lack of dark pigmentation at the apex, are constant and characteristic features.

Abdomen of the ♀. In the ♀ the second tergite was figured by me (op. cit., fig. 17) as quite bare on its surface, and in some specimens it is so: but in Speiser's type of *parvula* from Sumatra, and in many of the Formosan specimens (perhaps the majority) its surface is covered with very short scattered bristles. The long bristles on the hind margin of the chitinous dorsal plate before the anal segment (b. in Fig. 17, op. cit.) were figured as 4, but are perhaps more usually 6, in number.

My figure of the under surface of the ♀ abdomen (op. cit., fig. 18) was somewaht misleading, as the abdomen of the specimen was much shrunken. In a ♀ with distended abdomen it can be seen that sternite 2 has three or four irregular rows of short bristles on its surface and long bristles on its hind margin: sternite 3 has two irregular rows of short bristles on the posterior part of its surface and long bristles on its hind margin: sternite 4 is bare on the membranons portion of its surface, but has two darker and more firmly chitinised areas, separated in the middle line, and each bearing alternating long and very short bristles on its hind margin: [my former description and figure were erroneous, stating that sternites 3 and 4 were both represented by two chitinous areas, whereas in reality only sternite 4 bears such areas]. Sternite 5 is without bristles on its surface, but in a specimen with very distended abdomen the alternating longer and shorter bristles on its hind margin are seen to form a bisinuate line, at either end of which is a small area darker and more firmly chitinised than the surrounding membrane. Sternite 6 is short, bare, and membranous, with longer and shorter bristles on its hind-margin forming two groups, separated by a very small space in the middle line. Just behind this median space are about 6 bristles standing in front of the genital opening. The anal segment ventrally bears a pair of blunt protuberances, one on either side of the anus, bearing short bristles and at their apices long bristles: [here again my former description is erroneous, stating that the anal segment bears two pairs of blunt protuberances, whereas the anterior pair really consisted of the lateral ends of the hind margin of the 6th sternite protruding from the shrunken abdomen].

Loc. Sumatra, Formosa, Ceylon.

This species appears to have occurred on more than one occasion in company with *N. allotopa*. The types of both species were found in the cave of Lian si Paghe in Sumatra, though I have seen no record of the host or times of capture. Among the Formosan material *parvula* and *allotopa* constantly occur from the same individuals of *Miniopterus schreibersi*. And in Ceylon both species were obtained by Mr. Fryer at Peradeniya on 30. I. 1912 from *Miniopterus schreibersi*, though whether or not from the same individual is not stated.

Material. *In spirit*: Tainan, 3. X. 1906, 45 ♂, 39 ♀. Tainan, 6. X. 1906, 30 ♂, 20 ♀. Tainan, 7. X. 1906, 14 ♂ 18 ♀. Taihorin, VI. 1911, from an undetermined bat, 2 ♂.

Dried specimens: Tainan, all dated X. 1906 (except 1 ♂, X. 1907—9), 9 ♂, 6 ♀.

5. *Nycteribia* (*Listropodia*) *pedicularia* Latreille.

Nycteribia pedicularia Latreille, Hist. nat. Crust. et Ins., XIV. 1805, p. 403, tab. 112, fig. 14.

Pthiridium latreillei Leach, Zool. Misc., III. 1817, p. 56.

Listropodia latreillei Kolenati, Horae Soc. ent. Ross., II. 1863, p. 55, tab. VI—VII, fig. 18a—c.

24 ♂♂ and 20 ♀♀ are referred to this species. For a long time I was in doubt whether to refer them to *N.* (*Listropodia*) *blasii* Kolenati (**op. cit.,** p. 49, tab. V, fig. 16a—e) or to *N.* (*L.*) *pedicularia* Latreille (= *latreillei* Leach). Finally I have come to the conclusion that these two are only distinct forms of the same species, and that the Formosan series, though in some respects intermediate, tends more to the pedicularia-form. A somewhat lengthy explanation is necessary. First the differences given by Kolenati between the two must be considered, and the chief ones are tabulated below:

Listropodia blasii.

Length 2 mm.

Thorax beneath only a little broader than long, with front margin much rounded.

♂. 2nd tergite with short bristles on either side of its surface, bare in the middle; 3rd and 4th tergites bare on their surfaces: anal segment very long. 3rd and 4th sternites with a few bristles only at the sides of the disc, the 4th with 5 thorn-like bristles (Borstenstacheln) in the middle of its hind margin.

Listropodia pedicularia.

Length 2.9 mm.

Thorax beneath much broader than long, curve of the front margin much flattened.

♂. 2nd, 3rd, and 4th tergites with scattered short bristles on the middle part of their surfaces: anal segment not much longer than those preceding it. 3rd and 4th sternites with short bristles on their discs, the 4th with 14 „Borstenstacheln" on its hind margin.

♀. 2nd tergite transversely trapezoidal with curved hind

♀. 2nd tergite more shield-shaped, with scattered short bristles only on the middle part of the disc, with short and very long bristles on the hind margin, 3—5 short ones between every two long ones. Connexivum representing the 3rd tergite with alternating long and short bristles on its hind margin. 4th and 5th sternites bare on the disc, on the hind margin bearing a row of short bristles and a row of alternating longer and shorter bristles.

margin: with short bristles on the middle part of the disc: with longer and shorter bristles on the hind margin, generally 3 shorter between every two longer ones. Connexivum (= 3rd tergite) without bristles on its hind margin. 4th sternite bare save for some short bristles on the middle of the disc near the hind margin. 4th and 5th sternites with long bristles on the hind margin.

The above are the principal differences to be gathered from Kolenati's descriptions and figures, and they appear to me unsatisfactory. For comparison I have had before me the following material: 7 ♂ and 16 ♀ of *blasii* (in alcohol) from 4 different localities in Britain, named by Speiser, and kindly lent by the Hon. N. C. Rothschild; 2 ♀ *blasii* preserved dry (determined by Lichtwardt and Speiser respectively), and 1 ♂ and 1 ♀ of *pedicularia*, also preserved dry and determined by the same gentlemen, all kindly lent from the Deutsches Entomologisches Museum; and lastly, 3 ♂ and 2 ♀ collected at Hammam Meskoutine in Eastern Algeria by Mr. P. A. Buxton, and referred by me to *pedicularia*. Of course I have not seen the actual types of *blasii* or *pedicularia*. The old writers Latreille, Leach, Curtis and Westwood, all of whom have been consulted, mention no characters of *pedicularia* which might distinguish it from the later described *blasii*.

In size the German and Algerian specimens of *pedicularia* are much larger than the British or German *blasii*: but the Formosan specimens, though corresponding in size more with the *blasii*, yet have certain characters of *pedicularia*. In the form of the thorax beneath, I have been unable to detect much appreciable difference in the two forms: in all the specimens the thorax appears a little broader than long[4]), but how much so is very difficult to measure, since its appearance is often deceptive and differs greatly according to the exact angle at which it is viewed. In the ♂ abdomen: the presence or absence of short bristles on the discs of the tergites is not alwavs a constant character. In the British examples of *blasii* the 3rd tergite has short bristles on its disc,

[4]) Speiser, in his key for determining the species (Arch. Naturg., 67. 1. 1901, p. 59) separates *blasii* from *pedicularia* by the form of the thorax beneath: „rundlich, so breit als lang" = *blasii*; „breiter als lang" = *pedicularia*. Schiner had previously adopted a nearly similar arrangement in Fauna Austriaca, Dipt., II. 1864, pp. 654—6.

while on the 4th they are present in small number in some specimens and absent in others; whereas according to Kolenati both tergites should be bare. In the Formosan ♂♂ the 2nd, 3rd, and 4th tergites all bear short bristles on their discs, which is a character of *pedicularia*. In the length of the anal segment I can detect no great difference in the two forms, and this also is sometimes deceptive, the apparent length varying greatly according to the degree of extension of the abdomen. The number of the short bristles on the discs of sternites 3 and 4 appears to be variable: in two British ♂♂ of *blasii* they extend across the discs of both sternites, but in one of the specimens they are very scanty in the middle of the 4th. In the number of the short „Borstenstacheln" on the hind margin of the 4th sternite there certainly appears to be a difference between the British examples of *blasii* and the German and Algerian *pedicularia*, the number being much greater in the latter, but in the Formosan specimens the number varies greatly, and I have counted 7, 9 and 11 in three different ♂♂, which numbers are all intermediate between those given by Kolenati for the two forms, showing that this character is not always constant.

Turning to the ♀ abdomen: the shape of the 2nd tergite and the nature of its posterior marginal bristles are the best characters I have found for distinguishing the two forms. But even here the Algerian ♀♀ present some difficulty, for though in all other respects they conform to *pedicularia*, yet the middle part of the hind margin of the 2nd tergite approaches a little to the form found in *blasii*. The Formosan ♀♀ all have this 2nd tergite decidedly of the *pedicularia*-form, i. e. more trapezoidal, not produced into a blunt shield-like shape in the middle behind, and with the marginal bristles forming a more even row, the proportion of longer bristles being more, so that often only one shorter one (instead of several) stands between every two longer ones. The presence or absence of longer bristles on the hind margin of the connexivum representing the 3rd tergite is not in my opinion a good character. In some at any rate of the named specimens of both *blasii* and *pedicularia* the most posterior bristles on the connexivum are somewhat longer than those in front. The presence or absence of a few short bristles on the posterior part of the middle of the disc of the 4th sternite does not seem to be a good character; in at least one British ♀ of *blasii* they are present where they ought to be absent, while in the Formosan ♀♀ they are absent where they ought to be present. In the marginal bristles on the 4th, 5th, and 6th sternites there is a slight difference between the Formosan specimens and the British ♀♀ of *blasii*. In the *blasii* the short bristles form an irregular row a little in front of the long ones: in the Formosan ♀♀ the separation into two rows is less evident, the two tending to coalesce into a single row of long and short bristles, and having a more even appearance.

In conclusion, it must be stated explicitly that *blasii* and *pedicularia* are not absolutely identical: but the present writer considers the differences insufficient to entitle them to specific rank, but rather that they should be looked on as two forms of the same species. If this is so, the Formosan series is in some ways intermediate: the thorax beneath is roundish and very little broader than long (character of *blasii*); the 2nd tergite of the ♀ has decidedly the *pedicularia*-form, but its disc bears only very scanty minute bristles in some specimens and is quite bare in others; and lastly the ♂ 2nd, 3rd, and 4th tergites bear more or less short bristles on their discs, which is a character of *pedicularia* rather than of *blasii*.

If these conclusions are correct, the species must be known by Latreille's name as „*Nycteribia* (*Listropodia*) *pedicularia*": while Kolenati's *blasii* will become „*Nycteribia* (*Listropodia*) *pedicularia* Latr. var. *blasii* Kol." The term „var." is here used *sensu lato*, for it is uncertain exactly what rank — whether subspecific, varietal, &c. — should be assigned to *blasii*. The geographical ranges of the two forms coincide at any rate in part. Both are now known from many parts of Europe and from North Africa (Tunis and Eastern Algeria): in addition *pedicularia* is recorded from South Africa by Speiser[5]), and from Formosa in this paper. Both forms have been found on *Miniopterus schreibersii*, and on several other hosts (most of which are not the same for the two forms[5]).

List of the Material. *In spirit*: Anping, 22. IX. 1906, 2 ♂, 1 ♀. Anping, 26. IX. 1906, 5 ♂, 5 ♀. Anping, 30. IX. 1906, 1 ♀. Tainan, 3. X. 1906, 10 ♂, 12 ♀. Tainan, 6. X. 1906, 2 ♂, 1 ♀. Tainan, 7. X. 1906, 2 ♂.

Dried specimens: Tainan, dated X. 1906 and X. 1907—9, 3 ♂.

H. Sauter's Formosa-Ausbeute. Buprestiden

3. Teil.

Von

Ch. Kerremans.

Anthaxia aeneocuprea nov. sp. — Long. 4,5; larg. 1,5 millim.

Ressemble à l'*A. funerula* Illig., d'Europe, mais d'une coloration générale un peu plus claire, les côtés du pronotum moins arqués et sa base à peine convergente, mais presque parallèle, sa marge antérieure sans lobe médian anguleux.

Oblong ovale, atténué en arrière, d'un bronzé clair légèrement cuivreux.

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*5) Speiser, Arch. Naturg., 67. 1. 1901, pp. 53, 54.