# A Revised List of Danish Bombyliidae (Diptera), with a Subspecific Division of Villa circumdata Meig.

By
Leif Lyneborg
Zoological Museum, Copenhagen, Denmark.

**Abstract.**

The paper presents a complete list of Danish Bombyliidae, with notes on taxonomy, occurrence, and flying periods. The total number of species and subspecies of this family hitherto known from Denmark is 18. Lundbeck (1908) mentions 14 species, and the additional species are as follows: *Bombylius discolor* Mik., *Anthrax varia* F., and *Exoprosopa capucina* F. *Villa circumdata* Meig. s. Lundbeck has been divided into two subspecies: *V. c. circumdata* Meig. and *V. circumdata longicornis* n. ssp.

1. **Phthiria pulicaria** Mikan, 1796.
   *Phthiria pulicaria* Lundbeck, 1908, p. 129.

The species has been found in several localities in Northern and Western Jutland, on Funen (Fåborg), in the northern part of Zealand, and on Anholt and Bornholm. Dates given are from the middle of June to the end of July.

2. **Phthiria canescens** Loew, 1846.
   *Phthiria canescens* Lundbeck, 1908, p. 131.

Only one male specimen known from Denmark. It was taken in July 1883 at Allinge on Bornholm by H. J. Hansen.

3. **Bombylius discolor** Mikan, 1796.
   *Bombylius discolor* Kryger, 1924, p. 33.

The species was first recorded by Kryger (l. c.). It is now known from three localities in the central parts of Zealand.

Boserup near Roskilde, ♂, 5.IV.1920, J. P. Kryger leg.
- - - 5 ♂♂ 2 ♀♀, 10.IV.1921, J. P. Kryger leg.
- - - ♂, 14.IV.1938, J. P. Kryger leg.
Kimmerslev Hessel near Borup, ♂ ♀, 10.V.1942, H. Krogh leg.
Køge Ås, ♀, 18.IV.1948, K. Sparre leg.

It is an interesting fact that the spot-winged *Bombylius* species which occurs in Sweden is not conspecific with the Danish species. All Swedish specimens seen by the author were *medius* L.

4. **Bombylius major** Linné, 1758.
*Bombylius major* Lundbeck, 1908, p. 123.

Lundbeck knew this species from Zealand and Lolland only. Since then it has been taken in all parts of Jutland, and also on Funen and Bornholm. The material dates from 4th April to 1st June. It is more of an inland species than the following one.

5. **Bombylius minor** Linné, 1758.
*Bombylius minor* Lundbeck, 1908, p. 124.

Nearly all localities in which this species has been captured are close to the coast. In Jutland it has been taken in several localities along the west coast, from Skagen (the Skaw) to Skallingen (opposite Esbjerg). In addition, the species is known from two localities on the east coast of Jutland, the northern part of Zealand, and from Læsø, Anholt and Bornholm. Its flying period is much later than that of *major*. The Danish material dates from 27th June to 11th August.

6. **Systoechus sulphureus** Mikan, 1796.
*Systoechus sulphureus* Lundbeck, 1908, p. 127.

In Jutland the species is distributed along the west coast and in the central part of the peninsula. It has also been taken on Læsø, Samsø, Funen and in the northern part of Zealand. Dates given are from the middle of June to the beginning of August.

7. **Anthrax anthrax** Schrank, 1781.
*Argyramoeba anthrax* Lundbeck, 1908, p. 97.

The species is still only known from the three undated female specimens mentioned by Lundbeck.

8. **Anthrax varia** Fabricius, 1794.

1 ♀ was captured on 27.VI.1964 at Vester Sømarken on the southern coast of Bornholm by Ole Martin and Bo Vest Pedersen. The species is new to Denmark.

9. **Exoprosopa capucina** Fabricius, 1781.

This species was first taken on 5th July 1937, when Esben Petersen collected 1 ♂ and 2 ♀♀ in Frøslev Mose. 2 ♂♂ were cap-

tured on 24th June 1949 and 4th July 1950 in Stensbæk Plantation by Worm-Hansen. Both localities are situated in the southern part of Jutland. The species is not known from Sweden and Great Britain and seems, thus, to have its north-western limit in Southern Jutland.

10. **Thyridanthrax fenestratus** Fallén, 1814.
*Anthrax fenestratus* Lundbeck, 1908, p. 107.

The species has mainly been found in Jutland, and here predominantly in the northern, western, central and southern parts. More than twenty localities are known from these regions, and there is only a single record from the eastern part of the peninsula. In accordance with this distribution-pattern, the species has also been collected on Læsø, Anholt, Samsø, in Northern Zealand (where sandy areas are common), and on Bornholm. The flying period dates from the beginning of June to the beginning of September.

11. **Thyridanthrax afer** Fabricius, 1794.
*Anthrax afer* Lundbeck, 1908, p. 110.

This species has been taken at Hasle and Hammeren on Bornholm, by H. J. Hansen, Schlick and Esben Petersen, all in July. There is also a single specimen (no data given), in Coll. Stæger.

12. **Hemipenthes morio** Linné, 1758.
*Hemipenthes morio* Lundbeck, 1908, p. 102.

In Jutland this species has been found only in the northern part, and is here known from six localities. In addition, it has been collected on Læsø, in Northern Zealand, and on Lolland and Bornholm. Dates from 2nd June to 8th August.

13. **Hemipenthes maurus** Linné, 1758.
*Anthrax maurus* Lundbeck, 1908, p. 109.

*Maurus* has mainly been taken in the dune areas on the west coast of Jutland. Material exists from eight localities from Skagen (the Skaw) in the North to Aargab (at Ringkøbing Fjord) in the South, plus a single record from Djursland on the east coast. It has also been collected in Northern Zealand. Lundbeck (l. c.) also mentions Bornholm, but the present author has not seen any specimens from this island. Dates from 18th June to 9th August.

14. **Villa occulta** Wiedemann (Meigen), 1820.
*Anthrax occultus* Lundbeck, 1908, p. 112.

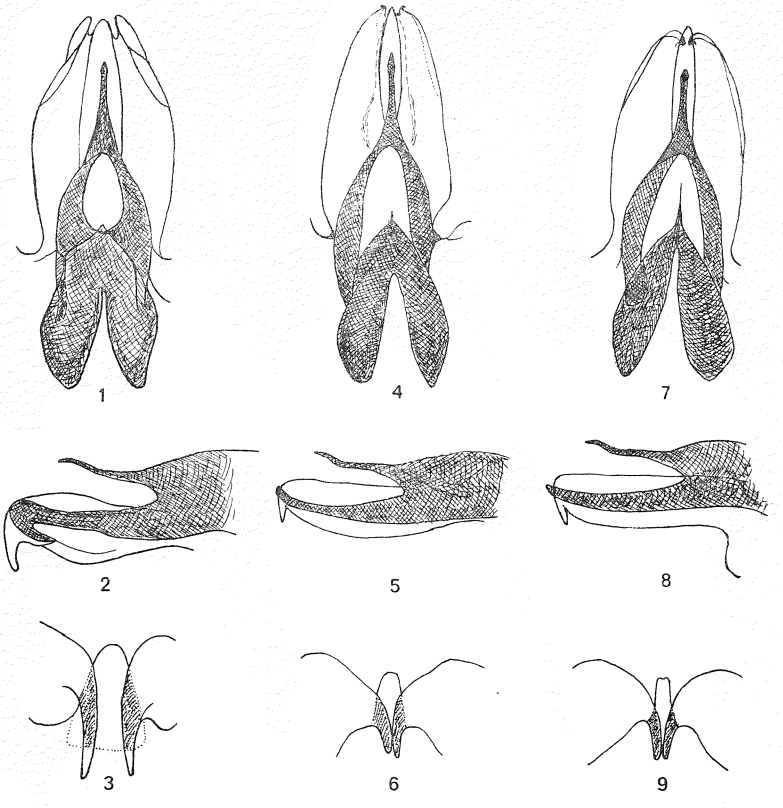
This is known from only a few specimens collected in the central and eastern parts of Jutland. H. J. Hansen collected 1 ♀ in July 1878 and 1 ♀ July 1880 at Frijsenborg. Axel Petersen collected 1 ♂ on 14th August 1906, and 1 ♀ on 17th August 1907 at Jenskær near Silkeborg. The species is not known from Great Britain. In Sweden it has been recorded from two provinces only, namely Dalarna (Tjeder 1941, p. 57), and Norrbotten (Dahl 1951, p. 95).

15. **Villa modesta** Meigen, 1820.
*Anthrax paniscus* Lundbeck, 1908, p. 114.

It became soon evident during revision of the Danish species of *Villa* that Lundbeck's *paniscus* could not be conspecific with *paniscus* Rossi sensu Engel (1938, p. 594), the aedeagus of which has a very characteristic profile (vide textfig. 235 in Engel, l. c.). The aedeagus of Lundbeck's *paniscus* (figs. 1-3) differs from that of Engel's *paniscus* in the presence of long, curved tips, and is very similar to the aedeagus of *hottentotta* L. figured by Engel (l. c., textfig. 233). Engel considers *Villa modesta* Meig. to be only a variety of *hottentotta,* and states that the aedeagus of both forms is almost identical. The present author has followed Seguy (1926, p. 200) in giving it species rank. Seguy synonymizes *paniscus* Verrall, 1909 (nec Rossi) with *modesta* Meig. Mr. J. E. Collin, Newmarket (in litt. 31st Dec. 1963) informed the author that Verrall's *paniscus* is the same as Lundbeck's *paniscus;* this was confirmed by the author's personal examinations in London and Oxford in September 1964.

During a visit to Paris in September 1964 the author was able to examine the types of Bombyliidae in Meigen's collection. A male specimen of *Villa* was found under no. 680, labelled "Anthrax modesta ♂". This specimen is in a rather good condition and possesses the following essential characters: Frons provided with blackish scaly hairs. Patagium brown. Abdomen without bands, only a few pale scaly hairs present at hind margins of fifth and sixth tergites. Marginal tufts of these tergites comprised of exclusively blackish hairs. Sternites without pale scaly hairs.

There can be no doubt that the above-mentioned specimen is not the type specimen to Meigen's "Anthrax modesta". His descrip-




Figs. 1-9. Aedeagus of *Villa* species. 1-3. *V. modesta* Meig.; 4-6. *V. c. circumdata* Meig.; 7-9. *V. circumdata longicornis* n. ssp. — Figs. 1, 4 and 7 show the aedeagus in a dorsal view; 2, 5 and 8 in a lateral view; and 3, 6 and 9 in a caudal view.

tion is very brief, he definitely mentions the patagium as being "silberglänzendem". The specimen will, in this paper, be treated as conspecific with *Villa paniscus* sensu Engel (l. c., p. 594), though there are some discrepancies with Engel's description. *V. paniscus* Rossi s. Engel has not hitherto been found in Denmark, but the author has seen Swedish specimens which possess the same combination of characters as mentioned above. During a visit to Uppsala in August 1964, Mr. Lars Hedström showed the author some dissections of the Swedish specimens; the aedeagus was quite similar to that figured by Engel as *paniscus* Rossi. Further investigations will probably prove that two species have

been mixed together here, the first with a silvery-white patagium (*paniscus* Rossi s. Engel) and the second with a brown patagium (represented by specimen No. 680 in Meigen's collection and by the mentioned Swedish specimens).

In comparison with *paniscus* Rossi s. Engel, the male of *modesta* Meig. in the sense of the present paper possesses the following combination of characters: Frons with exclusively pale scaly hairs. Patagium silvery-white (sometimes single brownish scales). Abdomen not banded, though with pale scaly hairs on lateral parts of second to fourth tergites (those on second tergite sometimes nearly reach middle line). Marginal tufts of fifth and sixth tergites with blackish hairs, but some paler hairs are intermixed, especially along the hind margins. Sternites with predominating pale, scaly hairs.

The female of *paniscus* is similar to the male with regard to colour of patagium, scaly hairs on frons, and the marginal tufts of fifth and sixth tergites. It is provided with broad bands of pale scaly hairs on second and fourth tergites (but not on third!) and narrower bands at hind margins of fifth and sixth tergites. The sternites with predominating pale, scaly hairs.

The female of *modesta* is similar to the male with regard to colour of scaly hairs on frons, and marginal tufts of fifth and sixth tergites. Patagium has mixed whitish-yellow and brownish scaly hairs. Abdominal bands as in female of *paniscus,* but with a distinct band of pale scaly hairs on third tergite also, and the bands on fifth and sixth tergites broader. The sternites with predominating pale, scaly hairs.

*V. modesta* Meig. has been recorded from four localities on the west coast of Jutland, and from Mols in Eastern Jutland. In addition, it has been taken on Anholt, in some localities in Northern Zealand, at Faxe Ladeplads in Southeastern Zealand, and on Bornholm. The flying period in Denmark is from the beginning of July to the middle of September.

16. **Villa hottentotta** Linné, 1758.
*Anthrax hottentottus* Lundbeck, 1908, p. 116.

Lundbeck based his *hottentottus* on four female specimens from Coll. Stæger, taken many years ago at Vedbæk in Northern Zealand. Since then the species has not been captured in Denmark. The present author has also examined ten specimens of both sexes from Sweden.

The male of *hottentotta* is very similar to the male of *modesta,* agreeing in the presence of pale scaly hairs on frons, in having pale scaly hairs on lateral parts of second and fourth tergites, and in having mixed blackish and pale hairs in the marginal tufts of fifth and sixth tergites. It differs from *modesta* in having patagium compound of predominately brownish- mixed with yellowish-white scaly hairs, and in the yellowish-white (not silvery-white) tufts at the hind margin of seventh tergite. There are also a few pale scaly hairs on the sternites.

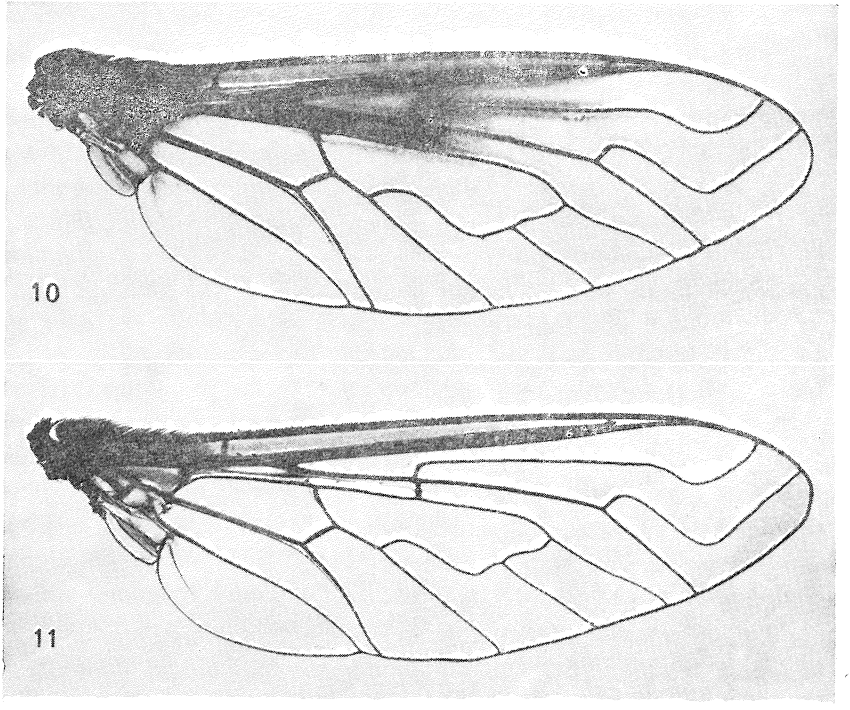
The females of *hottentotta* and *modesta* are more difficult to separate. As in the males, both species have pale scaly hairs on frons, and mixed blackish and pale hairs in the marginal tufts of fifth and sixth tergites. Patagium is composed of brownish and yellowish-white scaly hairs in both species, and third sternite has pale scaly hairs on hind third only. As in the male, there is a difference in colour of the hindmarginal tufts of seventh tergite, but this is less distinct than in the male. There is also a difference in the distribution of the five abdominal bands of pale scaly hairs, these being broader and more distinct in *hottentotta* than in *modesta.* Moreover, *hottentotta* is a larger and more broadly built species.

It will be obvious that *V. hottentotta* L. s. Engel can hardly be conspecific with *hottentotta* L. of the present paper, and the former should probably be given the name *flava* Meig.

17. **Villa circumdata circumdata** Meigen, 1820.
*Anthrax circumdatus* Lundbeck, 1908, p. 113, p.p.

Lundbeck's *circumdatus* consists of two forms, which in the present paper, have been treated as subspecies. Most of his material is referable to the subspecies described below as *longicornis* n. ssp., and only a single male specimen of the nominate form is present.

In the male, both subspecies of *circumdata* can be easily separated from *paniscus* Rossi s. Engel, *modesta* Meig., and *hottentotta* L. by the presence of bands of pale scaly hairs on second to sixth tergites, and by the short, downcurved tips of the aedeagus (figs. 5-6, 8-9). The females of the two subspecies can be separated from the females of the same species by the presence of pale scaly hairs on the whole surface of third sternite (not restricted to the hind third only, (except in *paniscus* Rossi s. Engel, which has blackish scaly hairs on frons)). There are also differences in the




Figs. 10-11. Wings of 10. *Villa c. circumdata* Meig. (from England), and 11. *V. circumdata longicornis* n. ssp. (from Zealand).

distribution of pale scaly hairs on fifth and sixth tergites. In the females of the three mentioned species, these scales are restricted to about hind third of each tergite, whereas in *circumdata* they are distributed on about one half to two thirds.

The Danish material of *circumdata* can be divided into two very distinct forms by means of additional characters, the most simple being the distribution of the infuscated area on fore part of the wing. In the first form the infuscated area reaches to $m_{1-2}$ (fig. 10), whereas in the second form it is restricted to the area between costa and $r_1$ (fig. 11). The length of the third antennal joint also offers differences of taxonomic value. In the dark-winged form the third antennal joint is distinctly shorter than in the clear-winged form, and there is overlapping to a small degree only (vide fig. 12). A third character is found in the colour of the hairs on lateral parts of the face. In the dark-winged form there are no (or very few) black hairs on lateral parts of face (below level of antennae).

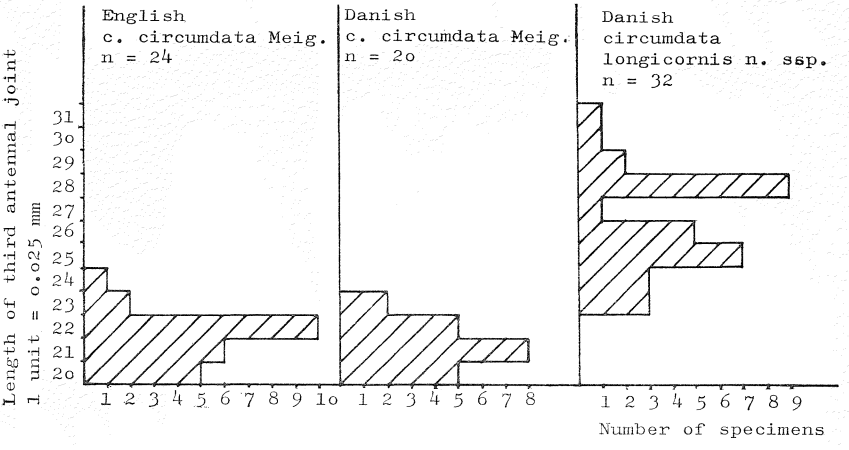



Fig. 12. The variation in length of third antennal joint in specimens of *V. c. circumdata* Meig. from England and Denmark, and in specimens of *V. circumdata longicornis* n. ssp. from Denmark.

In the clear-winged form the black frontal hairs continue along the eye-margin below level of antennae to about level of anterior mouth-margin. This third character is less distinct in females than in males.

Having found that the dark-winged form mainly occurs in Jutland and the clear-winged form on the islands (fig. 13), the author concluded that they should be treated as subspecies of the same species. This conclusion was strengthened by the fact that the male genitalia of both forms proved to be practically identical (figs. 4-6 and figs. 7-9).

Meigen's (l. c., p. 143) description is adequate enough and covers both sexes. In September 1964 the present author was able to examine the type-specimens of Meigen's "Anthrax circumdata Hgg." in Paris. Four specimens were found under No. 676, all belonging to the genus *Villa*. A female specimen in good condition and labelled "*Anthrax circumdata* ♀" agrees in all details with Meigen's description, and is hereby selected as a lectotype. A male specimen without a head seems to be of the same species, whereas two other specimens belong to another species.

The selected lectotype to *circumdata* is clearly the same as the darkwinged Danish form of *circumdata,* and consequently, this form must be named *Villa circumdata circumdata.* During visits to London and Oxford in September 1964, the author was able to

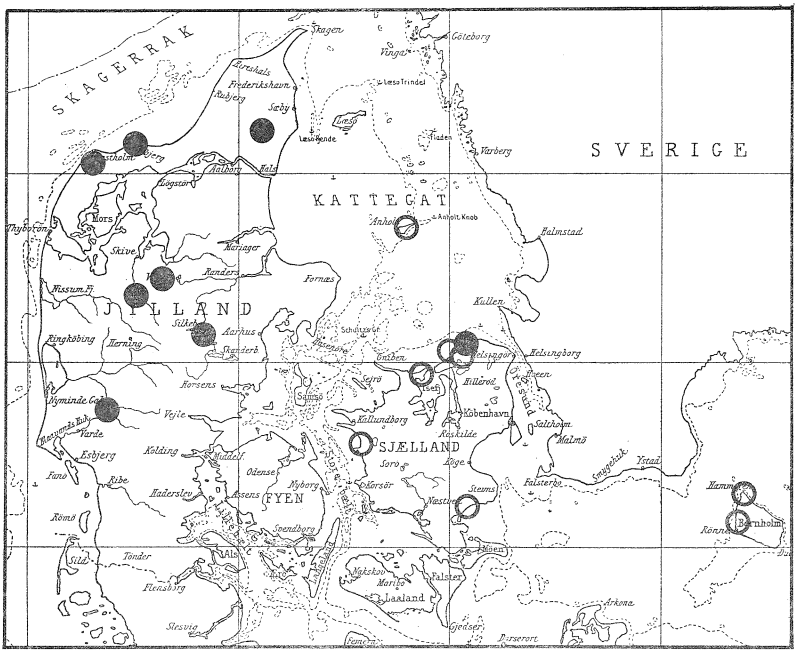



Fig. 13. The distribution of *Villa c. circumdata* Meig. (●), and *V. circumdata longicornis* n. ssp. (○) in Denmark.

examine a large series of British *circumdata,* and they all proved to be of the nominate form.

The clear-winged form will be treated below as *V. circumdata longicornis* n. ssp.

The total material of *V. circumdata circumdata* from Denmark is listed below:

Jutland, Dannerhøj, ♀, 28.VII.1920, A. Chr. Thomsen leg.
- , Bulbjerg, ♂, 24.VII.1908, Th. Mortensen leg.
- , Hansted Reservation, ♂ 15 ♀♀, 7-12.VIII.1953, J. G. Worm-Hansen leg.
- , Hansted Reservation, 2 ♂♂, 7.VIII.1957, J. G. Worm-Hansen leg.
- , Nørholm at Varde, ♂, 1.VIII.1918, ex Coll. Peder Nielsen.
- , Gindeskov at Skive, 2 ♀♀, 3-24.VII.1941, J. G. Worm-Hansen leg.
- , Mønsted at Viborg, ♀, 11.VIII.1911, ex Coll. Peder Nielsen.
- , Svejbæk at Silkeborg, ♀, 22.VII.1914, Jensen-Hårup leg.

Zealand, Tidsvilde Hegn, ♀, 3.IX.1872.

Without locality: 4 ♀♀ in Naturhistorisk Museum, Aarhus. The other material in Zoologisk Museum, Copenhagen.

The author has seen specimens from the English counties of Dorset, Surrey, and Hants. in the British Museum, London, and the Hope Department of Entomology, Oxford.

18. **Villa circumdata longicornis** n. subsp.
*Anthrax circumdatus* Lundbeck, 1908, p. 113, p.p.

As mentioned above, the major part of Lundbeck's *circumdatus* belongs to this subspecies. For the separation of the two subspecies, see above. A full description is given by Lundbeck (l. c.).

The following records can be given from Denmark:

Zealand, Asserbo, ♀, VII.1904, Klöcker leg., holotype.
- , Tisvilde, 8 ♂♂ 6 ♀♀, 11-14.VII.1907, W. Lundbeck leg., paratypes.
- , Tisvilde, ♂, 8.VII.1909, W. Lundbeck leg., paratype.
- , Tisvilde, 2 ♀♀, 4-6.VII.1910, W. Lundbeck leg., paratypes.
- , Tisvilde, ♂ ♀, 3-4.VII.1915, Klöcker leg., paratypes.
- , Tisvilde, ♀, 25.VII.1916, W. Lundbeck leg., paratype.
- , Tisvilde, Stængehave, ♀, 8.VII.1959, P. Bang leg., paratype.
- , Rørvig, 5 ♀♀, 23-28.VII.1908, W. Lundbeck leg., paratypes.
- , Nykøbing Lyng, ♂, VIII.1870, Budde Lund leg., paratype.
- , Nykøbing S., Nordstrand, 2 ♀♀, 26.VII.1942, Th. Mortensen leg., paratypes.
- , Osen N. of Reersø, ♀, VII.1933, Johs. Gröntved leg., paratype.
- , Faxe Ladeplads, ♀, 23.VII.1912, W. Lundbeck leg., paratype.

Anholt, 2 ♂♂, VI.1936, A. Jöker leg., paratypes.
- , 2 ♂♂, 24.VI.1934, R. Hørring leg., paratypes.

Bornholm, Hammeren, ♀, 24.VII.1908, W. Lundbeck leg., paratype.
- , Blykobbe, ♀, 23.VII.1932, paratype.

The total distribution of *V. circumdata longicornis* cannot be given, but, no doubt, this subspecies will represent *circumdata* in Scandinavia and Finland. The present author has seen four very fine specimens (♂ 3 ♀♀) from Hungary (Tatarszentgyörgy, VI, 1925, leg. Dr. Engel) in the München Museum, belonging to the same subspecies. These four specimens have been labelled as paratypes.

## Appendix.

A seventh form of *Villa* occurs in both Sweden and England, but has not yet been recorded from Denmark, viz. *V. cingulata* Meigen, 1804. The male is easily recognized by the combination of following characters: Frons with both blackish and pale scaly hairs. Patagium silvery-white. Three bands of pale scaly hairs on

abdomen, namely a broad one on fourth tergite and narrower bands at hind margins of fifth and sixth tergites. Also lateral parts of second and third tergites with pale scaly hairs. Marginal tufts of fifth and sixth tergites comprised of predominately blackish hairs, though single paler hairs are intermixed. Hindmarginal tufts of seventh tergite whitish but not very conspicuous. Wing infuscated to $r_1$ only.

The female of *cingulata* is similar to the female of *circumdata,* but can easily be separated by the numerous pale scaly hairs on middle part of seventh tergite which then form a broad band. The band on fourth tergite is also broader than in *circumdata,* almost occupying the entire tergite.

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