

## A TAXONOMIC STUDY ON THE SPECIES OF *LAMPROMYIA* MACQ. IN THE CANARY ISLANDS (DIPTERA: RHAGIONIDAE)

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### THE VERMILEONINAE OF THE CANARY ISLANDS

“Worm-lion” flies of the genus *Lampromyia* were first recorded from the Canary Islands 133 years ago, when Macquart (1838: 105, Pl. 4, figs. 7, 7b) briefly described *L. canariensis* Macq. and provided a good coloured drawing of a male. Shortly after, Macquart (1840: 29, figs. 1, 1a-d) redescribed the species, though without improving much on his original description, and gave a hopelessly poor figure of the insect. In neither account did he record any localities.

Knowledge of the worm-lions of the Canary Islands then developed in the following manner: -

- 1883: Brauer (p. 43) recorded larvae which he identified as *Vermileo vermileo* (Linn.) from the Canary Islands.
- 1908: Becker (pp. 22-23, fig. 4) redescribed *canariensis* on male specimens from Tenerife and gave a good illustration of one of these.
- 1921: Becker (p. 42) stated that he had found the two Palearctic species, *L. cylindrica* (Fabr.) and *L. pallida* Macquart, to occur on the Canary Islands along with *canariensis*, but he gave no details of specimens seen or localities from which the species were obtained.
- 1925: Lindner (pp. 6-7), in his revision of the Palearctic species of *Lampromyia*, mentioned only *canariensis* as occurring on the islands, and quoted Brauer's record of *Vermileo*.
- 1931: Wheeler (p. 148) rejected Brauer's record of *Vermileo* from the Canary Islands, and gave a description (p. 248) with an excellent figure, of flies, reared from *Lampromyia* larvae collected in Tenerife, which he identified as *canariensis*. He recorded (p. 252) that he failed to find larvae on La Palma, Gran Canaria and Lanzarote, and commented (p. 256) that *canariensis* seems to be confined to Tenerife. Wheeler accepted Becker's (1921) record of the two Palearctic species on the islands.
- 1936: Frey (p. 43, fig. 9), in his exhaustive account of the Diptera of the Canary Islands, recorded material which he identified as *canariensis* from Tenerife only.

- 1952: Fernandez described Tenerife material as *canariensis* and gave a sketch of portions of the hypopygium.
- 1960: Stuckenberg (pp. 247-250, figs. 32-36) described in detail the male genitalia of a Tenerife specimen identified as *canariensis*.
- 1963: Hemmingsen, in the preface to his work on the biology of *Lampromyia* larvae from the Canary Islands, reviewed the taxonomic literature. He recorded further material from Tenerife collected by Fernandez and material from Gran Canaria, all of which he referred to *canariensis*, but (pp. 253-4) he noted discrepancies between his specimens and descriptions given by Liiidner (1925) and Wlieeler (1931).

Thus, up to the present four Vermileonine species have been recorded from the Canary Archipelago, but from only two of the seven main islands, namely Tenerife and Gran Canaria.

In 1964, during correspondence with Dr. Hemmingsen, I suggested that he might compare the hypopygia of his Gran Canaria material with my illustrations of the hypopygium of a Tenerife specimen. He found that there were many differences, and sent material to me which showed conclusively that two species were involved. Subsequently Dr. Hemmingsen made special visits to each of the seven main islands in the Canary Archipelago in search of worm-lions and succeeded in finding them on every island. From these larvae a considerable number of *Lampromyia* imagos was reared, a selected lot of which was sent to me for study.

Dr. Hemmingsen's material shows clearly that there are three allopatric species present: a species which occurs on the four western islands of La Palma, Tenerife, La Gomera and El Hierro; a species confined to Gran Canaria in the centre of the group; and a species on the two eastern islands of Lanzarote and Fuerteventura (Fig. 1). Of these, the third (eastern) one in no way agrees with the figures and descriptions of Macquart, and cannot be *canariensis*. Although the western and Gran Canaria species are closely similar, I believe the former can conclusively be recognised as *canariensis*. Macquart's (1838, fig. 7) coloured illustration of a male shows the median mesonotal vitta to be continuous, not interrupted by a midline, pale brownish stripe, and the scutellum more or less uniformly greyish. The Gran Canaria species has the median vitta clearly divided by such a stripe and has a largely blackish scutellum. Accordingly I propose to consider the western species as *L. canariensis* Macq., and restrict the type locality to the island of Tenerife. The species on Gran Canaria is described below as *fortunata* n. sp., and the one on Fuerteventura and Lanzarote as *hemmingseni* n. sp.

Becker's (1921) record of *cylindrica* and *pallida* from the islands is rejected. While it is not impossible that a *Vermileo* might occur there, Brauer's (1883) record must be considered as doubtful in view of the absence of this genus in the extensive material collected by Dr. Hemmingsen.

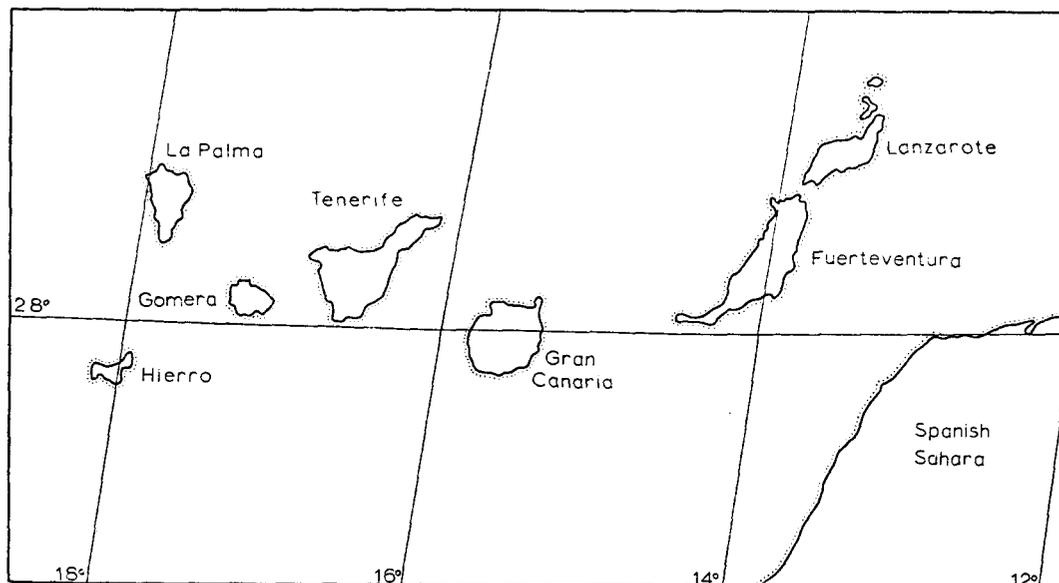


Fig. 1. The Canary Archipelago.

### SOME ZOOGEOGRAPHIC CONSIDERATIONS

A meaningful study on the zoogeography of the *Lampromyia* species of the Canary Islands will be possible only when the species in the countries around the western end of the Mediterranean have been revised. Nevertheless some aspects of this subject can be touched on. Firstly, the three Canaries species clearly are related to those of western North Africa and Spain, rather than to those of Southern Africa. Secondly, *hemmingseni* very closely resembles in external characters, and may be closely related to, the Moroccan species *L. lecerfi* Séguy. This is not unexpected. A North African ancestry for many of the insect species of the Canaries is well documented in the extensive memoir of the Société de Biogéographie (1946) on the Atlantic Islands. Furthermore, as Beaumont (1968: 250) comments in his study on the Sphecidae of the Canary Archipelago, "Il ne faut pas oublier non plus qu'il serait plus normal de comparer la faune de l'archipel, non pas à celle de l'Afrique du N.-O. entière, mais à celle d'une surface comparable du territoire marocain".

A consideration of the distribution of the species on the various islands necessarily involves, albeit speculatively, the historical geomorphology of the archipelago. A widely held view, as stated by Beaumont (op. cit: 253-4), is that the Canaries are not true oceanic islands, but are the vestiges of a former westward extension of Africa. Also, "L'étude de la faune de divers groupes d'animaux permet de distinguer assez nettement un archipel oriental (Lanzarote et Fuerteventura) et un archipel occidental (Tenerife, Gomera, Hierro et Palma); l'île de Gran Canaria se rattache au groupe occidental, mais avec certains rapports avec le groupe

oriental. On peut admettre que, de la presque île primitive, s'est détaché tout d'abord le groupe d'îles occidentales, dont le morcellement aurait débuté par la séparation de Gran Canaria, tandis que les îles orientales sont restées plus longtemps en contact avec le continent." The apparent affinities and distribution of the three *Lampromyia* species accord well with this view; the western species, *canariensis*, is very similar superficially to *fortunata* of Gran Canaria, whereas *hemmingseni* of the two eastern islands closely resembles in colouration *lecerfi* of Morocco.

However, the situation may not be so straightforward. Indeed, the species *canariensis* and *fortunata* are so similar, and so different to *hemmingseni*, that they appear to be vicariants, and *hemmingseni* is so like *lecerfi* that it appears to be an island vicariant of the latter; but other data suggests that these may not be the real relationships. The male genitalia of *hemmingseni* and *fortunata*, while differing abundantly in details, agree in several important features, notably the presence of two unusual, deep pits in the hypandrium, only a very small ventral aperture in the synsternite, and an extensive membranous development of the apical portion of the aedeagus. In *canariensis* the hypandrium has only a shallow central depression, the synsternite is deeply cleft by a large ventral aperture, and the aedeagus has quite another conformation. Many cases in insects are known in which colouration may be greatly changed by the action of a single gene; on the other hand, though I can offer no evidence in support, it seems reasonable to assume that complex changes in the various components of the hypopygium would require the action of numerous genes. If that is the case, the genitalia are a more reliable guide to relationships than colouration.

A comparable case exists in *Vermileo*, in which affinities suggested by colouration are contradicted by structural features of the hypopygium (Stuckenberg 1965). The species *nigriventris* Strobl (Spain), is like *ater* Stuckenberg (Crete) in being melanistic, and *vermileo* (Linn.) (Southern Europe) is similar to *niloticus* Edwards (Sudan) in colouring. However hypopygial features ally *ater* with *niloticus* and *vermileo* with *nigriventris*, a more satisfactory arrangement from the zoogeographic point of view.

#### ACKNOWLEDGEMENTS

To Dr. Axel M. Hemmingsen must go full credit for his thoroughness and perseverance in exploring the Vermilion fauna of the Canary Islands. My thanks are due to him for the loan of the material on which this study is based. Thanks are owing also to Dr. L. Tsacas of the Paris Museum for the loan of the type of *L.lecerfi* Ség.

## DESCRPTIONS OF SPECIES

This study was made on flies reared in Denmark from larvae collected in the Canary Islands. Reared material seldom is perfect, and allowance must be made for this in reading the descriptions below. A study of possible differences between island populations of *canariensis* and *hemmingseni* has not been attempted and probably can be made satisfactorily only with field-caught imagos.

Measurements of antennae were made from slide-mounted specimens; the length of the first segment was measured along its lower edge which is longer than the upper one. Holotypes of the new species are in the Zoological Museum, Copenhagen.

*Lampromyia* (s. str.) *canariensis* Macquart

*Lampromyia canariensis* Macquart, 1838, in Webb and Berthelot, Hist. nat. d'Iles Canar. p. 105, Pl. IV, figs. 7, 7b.

**Diagnostic Characters:** A darkly coloured species; two small, shining, blackish spots at lower end of frons, each adjacent to an eye margin, these occasionally absent or not in contact with eye; mesonotum with a broad, blackish, median vitta not divided in midline by a paler stripe, narrowly separated from sublateral vittae which are not as bold because of overlying greyish pruinescence; scutellum shining silvery-grey; abdominal tergites 3-7 in ♂ obviously depressed over basal half or a little less, this depressed area with dense, silvery-grey pruinescence which is very conspicuous in postero-dorsal view and contrasts strongly with shining blackish-brown of posterior portion; in ♀ abdomen similarly marked but basal depression less extensive, occupying a quarter to a third of tergite, pruinescence not as thick. Wing (Fig. 2) largely greyish with dark brown, conspicuous veins; costal and subcostal cells dark brown, stigma in apex of subcostal cell quite strong; an elongate, irregular substigmal mark in marginal cell above basal flexure of  $R_{2+3}$ , and a similar mark in 1st basal cell along and basal of prefurca, as shown; a narrow, dark strip along Cu, and, less obviously, in-cu: faint infumescence of membrane along all other veins, also around hind margin and more broadly in other parts of marginal and submarginal cells; in one specimen from Hierro some short appendages are present on veins R, (left wing) and  $R_{2+3}$  (right wing). Antenna with two segmented style, the various segments (starting with 1st) in following proportions - 55:25:43:9:82 - third segment thus shorter than basal one in the one specimen measured, but relative lengths of these segments apparently variable. Male genitalia as described and figured by Stuckenberg (1960).

Very similar in appearance to *fortunata* n. sp. described below, but differing in having the median mesonotal vitta undivided, the scutellum greyish instead of blackish, the costal and subcostal cells darkened, third antennal segment shorter than basal one, hypandrium with a simple central concavity, and synsternite very

deeply cleft by a large median aperture which extensively exposes the laterally flattened, well sclerotised aedeagus.

Wing Length (mm): longest, ♂ 7.8, ♀ 8.9; shortest, ♂ 6.7, ♀ 6.1.

Distribution:

Tenerife – Becker, 1908; Wheeler, 1931; Frey, 1936; Fernandez, 1952; Stuckenberg, 1960; Hemmingsen, 1963. Specimens seen from Punto Hidalgo, Barranco de Pino de Oro, Orotava, reared from larvae coll. A.M. Hemmingsen.

La Palma – specimens seen from Barranco del Carmen and Barranco de Juan Mayor, reared from larvae coll. A.M. Hemmingsen.

La Gomera – specimens seen from Calle de Monteforte, reared from larvae coll. A.M. Hemmingsen.

El Hierro – specimens seen from Barranco de Marrero, Lomo Alto, Malpais de Irama, Tesfabo, Barranco de Tejeleita, reared from larvae coll. A.M. Hemmingsen.

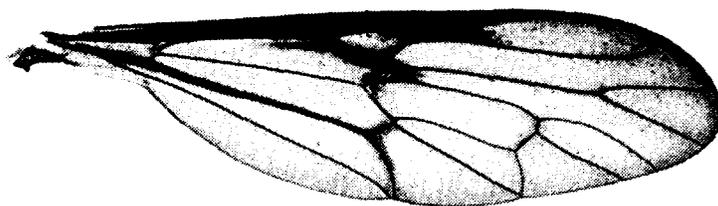
Notes : Wheeler (op. cit. : 248) records a rust-red colouring for this species, but Hemmingsen (op. cit.: 253-4) correctly points out that this probably was due to the red ochre in which the larvae developed and pupation and emergence occurred. Hemmingsen's material was reared in dark lava sand and none of the flies shows any reddish colouring.

#### *Lampromyia* (s. str.) *fortunata* n. sp.

*Lampromyia canariensis* Macq. Hemmingsen, 1963, Vidensk. Meddr dansk naturh. Foren. 125: 237-267.

Diagnostic Characters : Closely similar in appearance to *canariensis* but easily distinguished by having the median mesonotal vitta divided by a paler mid-line stripe, the scutellum blackish-brown to blackish, or largely so, and the costal and subcostal cells pale yellowish instead of conspicuously dark brownish; male genitalia are very different, in *fortunata* the synsternite can be seen under  $\times 10$  magnification not to have the deep ventral aperture of *canariensis*; antennae with an elongate third segment and apical style segment, third being more than twice length of second and longer than first.

Description: ♂. Face with silvery or pale ashy tomentum over brownish ground colour, some short, fine, brownish hairs present. Basal and second antennal segments pale brownish, third segment darker, two style segments present; relative length of antennal segments, starting with basal one, as follows – 42: 23: 59: 9: 86 – third thus larger than first and more than twice length of second, second style segment also relatively longer than in other Canarian species. Palps blackish. Lower sides of face bare, translucent, dark brownish. Proboscis elongate, slender, blackish, ranging in length from more than  $\times 3$  (67: 20) to more than  $\times 4$  (85: 20) mesonotal length. Frons shining ashy-grey pruinose. a small, subtriangular, shining, blackish-brown mark adjacent to each eye margin at lower end. Ocellar tubercle contrasting shining black. Occiput with irregular, velvety-black patches



2



3



4

Figs. 2-4. **Wing** of (2) *L. canariensis* Macq., La Palma specimen; (3) *L. fortunata* n.sp.; (4) *L. hemmingseni* n.sp., Lanzarote specimen.

adjacent to vertex, also with central blackish-brown pruinescence, shining ashy pruinescence along eye margins and broadly inward towards occipital foramen; occipital hairs shining pale brownish.

Mesonotum trivittate, median vitta dark black-brown, continuous from front to back, divided down midline by a yellowish-brown pruinose line which tends to fade out beyond mesonotal midlength; in some specimens this pale midline stripe anteriorly as broad as bounding dark stripes, in others not as broad. Yellow-brown patches, overlain with sericeous tomentum (almost golden in some positions), present around humeral calli, over lateral declivities of mesonotum and linearly along borders of median vitta, humeral calli concolorous except for bare, shining,

blackish-brown junction with notopleural ridge; two velvety black-brown sublateral vittae occupy remaining area, these starting anteriorly at about level of hind end of humeral calli and terminating posteriorly in subshining blackish patches above post-alar calli. Prescutellar crescents of thin sericeous tomentum present, separated by an obscure blackish-brown prescutellar mark.

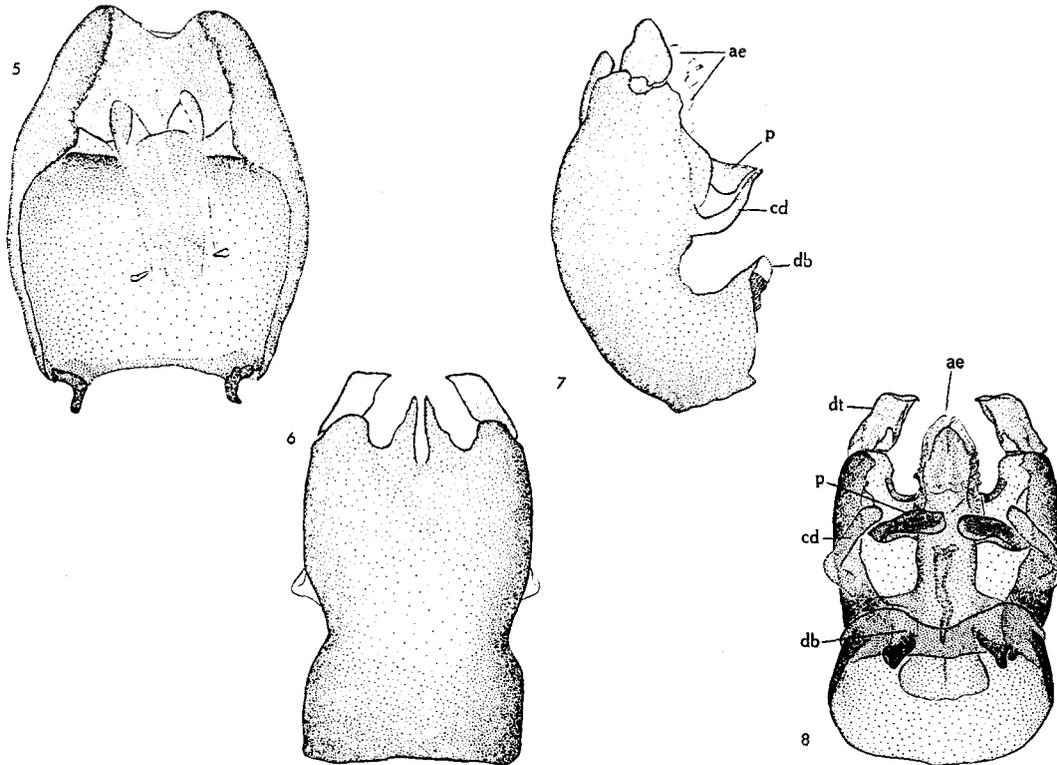
Scutellum mostly blackish-brown shining over basal part of disc, thinly sericeous pruinose laterally. Meso- and sterno-pleura dark brownish, remaining pleura pale, dull brownish, somewhat yellow-tinged, often with obscure, dark brown patches irregularly developed. Fore coxae contrasting pale straw-colour to pale yellowish-brown; other coxae dark to blackish-brown, mid-coxae darker and more shining than hind pair. Fore and middle legs pale yellowish-brown, darkened over apical three tarsomeres. Hind femora brownish basally, paler and more translucent distad over thickened portion, apical fifth contrasting dark brownish; hind tibia similarly coloured, apical dark part about  $1/4$  total length; basal  $2/3$  of hind basitarsus pale brownish, remainder and other tarsomeres dark brown.

Wing as in Fig. 3. Costal cell yellowish, subcostal cell pale yellowish or concolorous with remainder of membrane which is pale greyish in mature specimens. Stigma dark brown, concolorous substigmal mark in marginal cell; a brown streak in 1st basal cell, as shown; Cu basad of m-cu narrowly bordered with dark brown; faint brownish clouding elsewhere, as shown.  $R_{2+3}$  usually quite abruptly flexed near apex and not smoothly curved towards costa, in some specimens approaching the condition found in *canariensis*.

Abdomen moderately petiolate in mature specimens. Tergites somewhat depressed basad, thus shallowly concave in lateral profile, basally yellowish-brown for about a third of length, this part in some specimens with thin sericeous tomentum, remainder dark brownish usually with indefinite yellowish tinge, sometimes blackish-brown, lateral margins usually darker than median portion. Sternites indefinitely yellowish-brown with irregular, dark brown, midline mark.

Hypopygium large, bulging; 9th tergite as in Fig. 5, with two obvious, deep, adjacent, transverse inflexions in dorsal surface a little beyond middle, these separated by a rounded ridge and apparent on inner surface as two pronounced, irregular elevations; in lateral view profile of tergite strongly inflexed over midline ridge between pits. Proctiger as shown (Fig. 5), elongate, with two dark basal condyles. Synsternite (Figs. 6-8) with only a small elongate-ovoid aperture medially in distal margin, basad of this aperture an irregular, weakly sclerotised area. Dististyles as shown, with small, inclinate apical points. Upper margin of synsternite, near its midlength, with two slender, upcurved arms (cd.). Aedeagus (Figs. 8-9) an irregular tubular structure with membranous area over apical dorsal third; two large, prominent, expanded projections (p) as figured, these extending subtriangularly inwards.

♀. In general similar to ♂, abdomen not petiolate, tergites mostly reddish yellow-brown, darkened on lateral margins except for anterior third or a little more;



Figs. 5-8. ♂ genitalia of *L. fortunata* n. sp.; (5) hypandrium in ventral view, with proctiger; (6) synsternite in ventral view; (7) synsternite in lateral view; (8) synsternite and aedeagus in dorsal view. ae = aedeagus, cd = sclerotised projection from dorsal surface of synsternite, db = dorsal bridge, dt = dististyle, p = sclerotised projection from aedeagus.

antero-lateral corners more yellowed, here also some very thin sericeous tomentum in mature specimens; all of seventh, and about apical half of sixth, tergite pitchy black.

Wing Length (mm): longest, ♂ 7.7, ♀ 7.6; shortest, ♂ 5.5, ♀ 6.5.

Material Examined : ♂ holotype (V 1003), Gran Canaria, Barranco del Guinguada, March-April, 1967; 1♂ 1♀ paratypes, same data except ♂ coll. 14.1.65; Cenobio de Valeron, March-April, 1967, 1♂ 1♀ paratypes; Atalaya, March-April, 1967, 1♂ 1♀ paratypes; El Charco, Maspalomas, 14.3.1965, 1♂ 1♀ paratypes; El Rincón, Costa de Ayala, 14.1.1965, 23 1♀ paratypes. All collected as larvae and reared by Dr. A.M. Hemmingsen.

*Lampromyia* (s. sti-) *hemmingseni* n. sp.

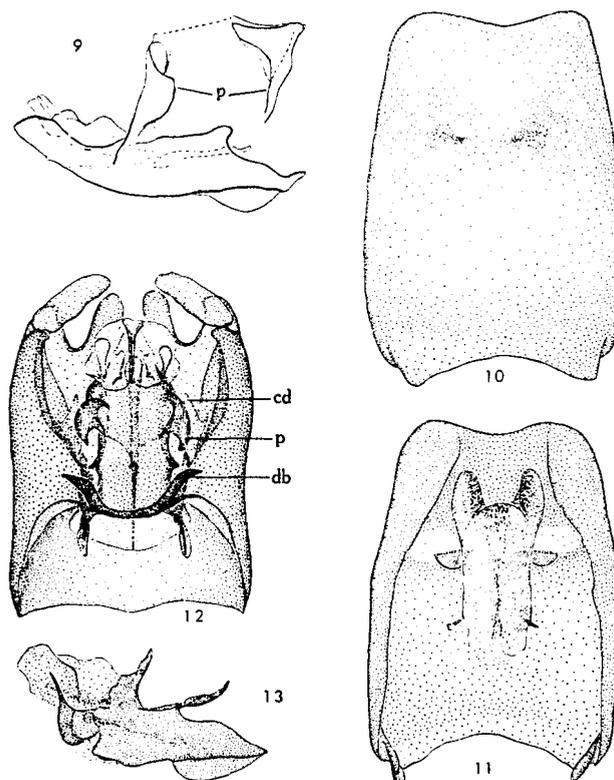
Diagnostic Characters : Predominantly a somewhat reddish-brown species with non-petiolate abdomen, an abundance of conspicuously dark, erect, quite long hair on the sides of the tergites, on the mesonotum, pronotum, propleura, face and occiput, and a distinctly vittate mesonotum, there being two narrow dark

paramedian stripes separated by a brownish midline stripe. Wing membrane quite darkly greyish:  $R_{2+3}$  with a curious deflexion apically. First flagellar segment of antenna unusually long, almost equal to second segment; first and third antennal segments equal in length. Hypopygium distinctive in all details; peculiar conformation of hypandrium and aedeagus especially noteworthy.

This species is obviously different from *canariensis* and *fortunata*, the colouring being distinctive even macroscopically. In external features *hemmingseni* is most similar to *lecerfi* Séy. which is based on a female holotype from the Grand Atlas Mountains of Morocco, kindly loaned for comparison by Dr. L. Tsacas of the Paris Museum; *hemmingseni* is distinguished, inter alia, by having the median mesonotal vitta divided in the midline (undivided in *lecerfi*), the wing membrane much darker grey, the stigma darker, and the apical part of  $R_{3+4}$  curiously flexed (this evenly curved forward to costa in *lecerfi*).

**Description:** ♂. Face thickly pale greyish-brown pruinose except on postero-ventral surface where dark brown ground colour shows through; hairs numerous, dark, semi-recumbent. Probocis long, slender, usually a little more than twice mesonotal length, dark blackish-brown. Palps pale brown with some stiff, dark hairs. Frons thickly greyish-brown pruinose, with a blackish chevron marking at lower end, contrasting blackish ocellar tubercle at vertex; ocelli approximately in equilateral triangle. Occiput dark brownish in ground colour, this irregularly showing through the brownish-grey pruinescence and fine, appressed, scale-like, golden hairs; numerous, erect, dark hairs present. Proportionate lengths of antennal segments, starting with basal one, as follows – 35: 16: 35: 13: 62 – first and third segments thus equal, first style segment unusually long; first two antennal segments concolorous with face, third segment and style dark brownish, former paler basally; some stiff, dark hairs present on first two segments.

Mesonotum to naked eye appearing somewhat reddish-brown with dark median vitta. Microscopically this vitta is seen to consist of two blackish-brown paramedian stripes separated by a midline stripe of brown not quite equal to them in width, these dark stripes tapering gradually posteriorly and fading out quite suddenly at about posterior third of mesonotum; lateral to paramedian stripes are brown strips concolorous with midline with which they merge to form a uniform prescutellar brown area; in sublateral position are obscure, quite wide, dark brownish vittae overlain with brownish and yellowish-brown pruinescence, these terminating above post-alar calli in small, contrasting, shining, blackish spots; declivous sides of mesonotum brownish with thick, pale golden pruinescence. An irregular blackish mark on junction of notopleural ridge and humeral callus, and on raised ridge anterior to wing attachment. Mesonotal hairs quite numerous, long, dark, erect. Scutellum subshining brownish, slightly yellow tinged, blackish in some specimens. Pleura translucent brownish, hind part of meso- and all of ptero-pleura except narrow posterior strip, bare and shining; pleura elsewhere quite thickly pale yellow-brown pruinose; a group of erect, dark hairs on convexity



Figs. 9-13, ♂ genitalia. (9) *L. fortunata* n. sp., aedeagus. (10-13) *L. hemmingseni* n. sp., Fuerteventura specimen; (10, 11) hypandrium in dorsal and ventral views respectively, latter with proctiger; (12) synsternite and aedeagus, dorsal view; (13) aedeagus in lateral view. Lettering as in Figs. 7, 8.

before haltere base. Coxae concolorous with pleura, except fore coxae paler, yellowish-brown. Fore and middle legs almost concolorous with their coxae, apical three tarsomeres darkened; hind legs pale yellow-brown, femur darkened over a little less than apical quarter, tibia indefinitely darkened over apical fifth, tarsus increasingly darker brown apicad. Wing (Fig. 4) dusty greyish slightly tinged with brown, an irregular darkening in 1st basal cell but not in base of this cell where there is a subtriangular clear area; stigma dark brownish, irregular.  $R_{2+3}$  in most specimens quite strongly curved basally, over apical section (see Fig.) abruptly deflexed then curving forwards quite strongly, usually though definitely sometimes without a minute stump vein on anterior side at beginning of flexure. Fork of  $R_{4+5}$  rather shallow and narrow.

Abdomen not petiolate, about of equal width throughout, to the naked eye appearing orange-brown: microscopically, irregular translucent areas break up the colour; sides of the tergites narrowly dark. Sternites orange-brown, with irregular, narrow, blackish-brown longitudinal midline stripe. Hairs abundant on sides of tergites and in sublateral, subtriangular patches, also over sternites except basal third of each which is glabrous; hairs erect, long, dark.

Hypopygiuin large; iinth tergite shaped as in Figs. 10, 11, on dorsal surface two deep, narrow, transverse pits, somewhat similar to those of *fortunata* but narrower and with a broader rounded area between; on inner surface (Fig. 11) these project prominently inwards and each bears a conspicuous, well-sclerotised flange. Proctiuger as shown in Fig. 11, elongate with prominent, widely separated cerci. Synsternite very deep, not arclied like that of *fortunata* (Fig. 7); ventral aperture very small and without adjacent weakly sclerotised area. Dististyles simple. On upper edge of synsternite are thinly sclerotised, somewhat blade-like, subtriangular projections (Fig. 12, cd). Aedeagus (Figs. 12, 13) as figured, a complex, irregular structure with extensive membranous protuberances apically, and two dark, strongly sclerotised projections (p) as figured.

♀. Not differing from the ♂ in any noteworthy way apart from usual sexual features.

Wing Lengthli (mm): longest, ♂ 7.2, ♀ 7.1; shortest, ♂ 6.7, ♀ 6.1.

Material Examined: ♂ holotype (V 489), Lanzarote, Puente de la Vega de Gualiza, 21.3.1965; 1♂ 1♀ paratypes with same data. Fuerteventura, Los Roques, Lajares, 18. 3. 1965; 1♂ paratype; Bayuyo, Corralejo, 17. 3. 1965; 1♀ paratype. All collected as larvae and reared by Dr. A.M. Hemmingsen.

## REFERENCES

- Beaumont, J. de, 1968: Sphecidae (Hym.) des Iles Canaries. – Bull. Br. Mus. nat. Hist. (Ent.) **21**(5): 247-278, 17 figs.
- Becker, T., 1908: Dipteren der Kanarischen Inseln. – Mitt. zool. Mus. Berlin **4**(1): 180pp., pls. 1-4.  
— 1921: Neue Dipteren Meiner Sammlung. – N. Beitr. syst. Insektenk. Berlin **2**: 41-48.
- Brauer, F., 1883: *Vermileo Degeeri* Macq. – Wien ent. Ztg. **2**: 114.
- Fernandez, J.M., 1952: La *Lampromyia canariensis* Macq. – Graellsia **10**: 11 pp., 5 figs.
- Frey, R., 1936: Die Dipterenfauna der Kanarischen Inseln und Ihre Probleme. – Comment. Biol. **6**(1): 237 pp., 10 pls.
- Hemmingsen, A.M., 1963: The Ant-lion-like Sand Trap of the Larva of *Lampromyia canariensis* Macquart (Diptera, Leptidae = Rhagionidae, Vermileoninae). – Vidensk. Meddr Dansk naturh. Foren. **125**: 237-266, 10 figs.
- Lindner, E., 1925: Rhagionidae (Leptidae). – In Lindner, E., Flieg. Palaeark. Reg. **4**(1): 33-49, 4 figs.
- Macquart, J., 1838: Dipteres. In Webb, P. & S. Berthelot, – Hist. nat. Iles Canaries. **2**(2) Ent.: 99-119, pl. 4 of vol. 1.  
— 1840: Diptera Exotique **2**: 29, pl. 3 bis, figs. 1, 1 a-c.
- Séguy, E., 1928: Diptères nouveaux de l'Afrique Mineure. – Bull. Soc. ent. Fr. 1928: 45-46.
- Société de Biogéographie, 1946: Contribution à l'Étude du Peuplement des îles Atlantides. – Mem. Soc. Biogéogr. **8**: 500 pp.
- Stiickenberg, B.R., 1960: Diptera (Brachycera) Rhagionidae. – S. Afr. anim. Life **7**: 216-308, 89 figs. Uppsala, Almqvist & Wiksell.
- 1965: Notes on the Palaearctic species of *Vermileo*, with the description of a new species from Crete (Diptera: Rhagionidae). – Ann. Mag. nat. Hist. (13) **8**: 495-500, 12 figs.
- Wheeler, W.M., 1931: Demons of the Dust. – pp. XVIII + 378, 49 figs. Kegan Paul, Trench, Trubner & Co., Lonclon.