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Drosophila lummei sp. n., a new species close to D. littoralis Meigen (Diptera, Drosophilidae)

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During the last few years the Finnish *Drosophila* research team (HACKMAN 1971) has kept numerous laboratory stocks of *Drosophila* species from Finland and other countries. Among these stocks are several identified as *D. littoralis* Meigen, which were used by Mr. Jaakko Lumme for studies on the drosopterine pigments of the testes. Some results of his studies and the failure of attempts to cross two strains led him to suppose that more than one species was involved and samples of the stocks in question were handed over to me for thorough morphological investigation. The stocks under the name *D. littoralis* could be separated in to two groups differing in three characters of the male genitalia. In the females I was not able to find any distinct separating characters. Attempts to cross the two groups of strains failed. Cytological investigations made by Dr. Marja Sorsa (unpublished) and isoenzyme investigations carried out by Dr. Seppo Lakovaara and Mr. Anssi Saura (unpublished) gave additional very distinct separating characters and it is now clear that distinct species are involved.

One of them, represented by 6 strains from Finland and 2 from Switzerland, was considered to be *littoralis* Meigen (probably described from France and in any case from the European continent). The chromocomes of the Finnish *littoralis* agree morphologically with the figures given by BURLA (1950) for a strain from Switzerland (Mellingen, Reusstal). Numerous male specimens identified as *littoralis* in the collection of the Zoological Museum in Helsinki have been checked and it is obvious that at least in southern Finland the species considered to be *littoralis* is the commoner.

Another group of three strains, one from Central Finland, one from Northern Sweden and one from USSR, Moscow (this last received from Dr.

Lynn Throckmorton, U.S.A.) represent another species described here as *D. lummei* n. sp. Specimens from various localities in Finland checked for certain isoenzymes indicate that the species is widespread in Finland and male specimens agreeing in the genitalia with those of the *lummei* stocks have been found among *littoralis* in the Museum's collection from various localities in central and northern Finland.

So far this would appear to be a clear case of a pair of sibling species which can be separated morphologically at least in the male sex. However, there is one strain from Swedish Lapland, Karesuando, the status of which is difficult to interpret. The males agree so well in genital characters with *lummei* that I have not been able to find any constant difference. The karyology studied by Dr. Marja Sorsa nearly agrees with *lummei* but the strain does not interbreed with *lummei* and a number of isoenzymes are different from those of *lummei*. The stock was started from a single female trapped in July 1970. The question of whether the Karesuando strain represents a third species must be left open until more material, new stocks from the area, are obtained.

The description of *D. lummei* sp.n. is as follows:

♂ — Body length about 3 mm, wing length 3 mm. Head in colour and chaetotaxy as in *littoralis*. Antennae dark, third joint darker than the second one. Arista with three or four long dorsal and two longer ventral branches in addition to the end fork, one or two small additional branches may occur. Width of jowls about 1/4 of vertical diameter of eye. Facial carina not different from that of *littoralis*. Vibrissa strong, more than twice as long as the second oral bristle. Mesonotum with the same colour and stripe pattern as in *littoralis*. Acrostichal hairs in 6 ill-defined rows. Bristles of mesonotum and scutellum as in *littoralis*. Colour and chaetotaxy of the pleura as in *littoralis*. Distal cross-vein of the wing shaded but the shaded area seems to be slightly smaller and paler than in *littoralis*. Costal index 2.8—3.3. The stronger costal fringe extends about 2/3rds to 3/5ths of the distance between the 2nd and 3rd vein. Legs as in *littoralis* but the penultimate and end joint of the tarsi are dark. (In *littoralis* the penultimate joint is usually paler, but this is not a reliable character for separating the species). Abdomen black without pattern. Male genitalia as in figs. 2, 3, 5, 6. 10 and 11. Surstyli with 5—6 dark teeth. In *littoralis* (male genitalis in figs. 1, 4, 7—9) these teeth as a rule number 7—8 but in rare cases 6. The decasternum of *lummei* differs distinctly from that of *littoralis* (figs. 6 and 7). There is also a small but constant difference between the two species in the shape of the paired end hooks of the penis (figs. 8—11).

♀ — Body length about 3—3.6 mm, wing length 3.5—3.6 mm. Extremely similar to the female of *littoralis*. In fact, no certain characters for separating the females of the two species has been found. Costal index of wing 3.1—3.3. Colour of tarsal joints as in the male. Ovipositor as in fig. 13. The number of teeth along the ventral margin of the ovipositor may vary and a separation from *littoralis* (ovipositor depicted in fig. 12) does not seem possible.

Holotype, ♂ Finland, *Sb:* Kuopio—Vaajasalo (grid 697:53, cf. HEIKINHEIMO & RAATIKAINEN 1971), from laboratory stock started in 1969 by Dr. Seppo

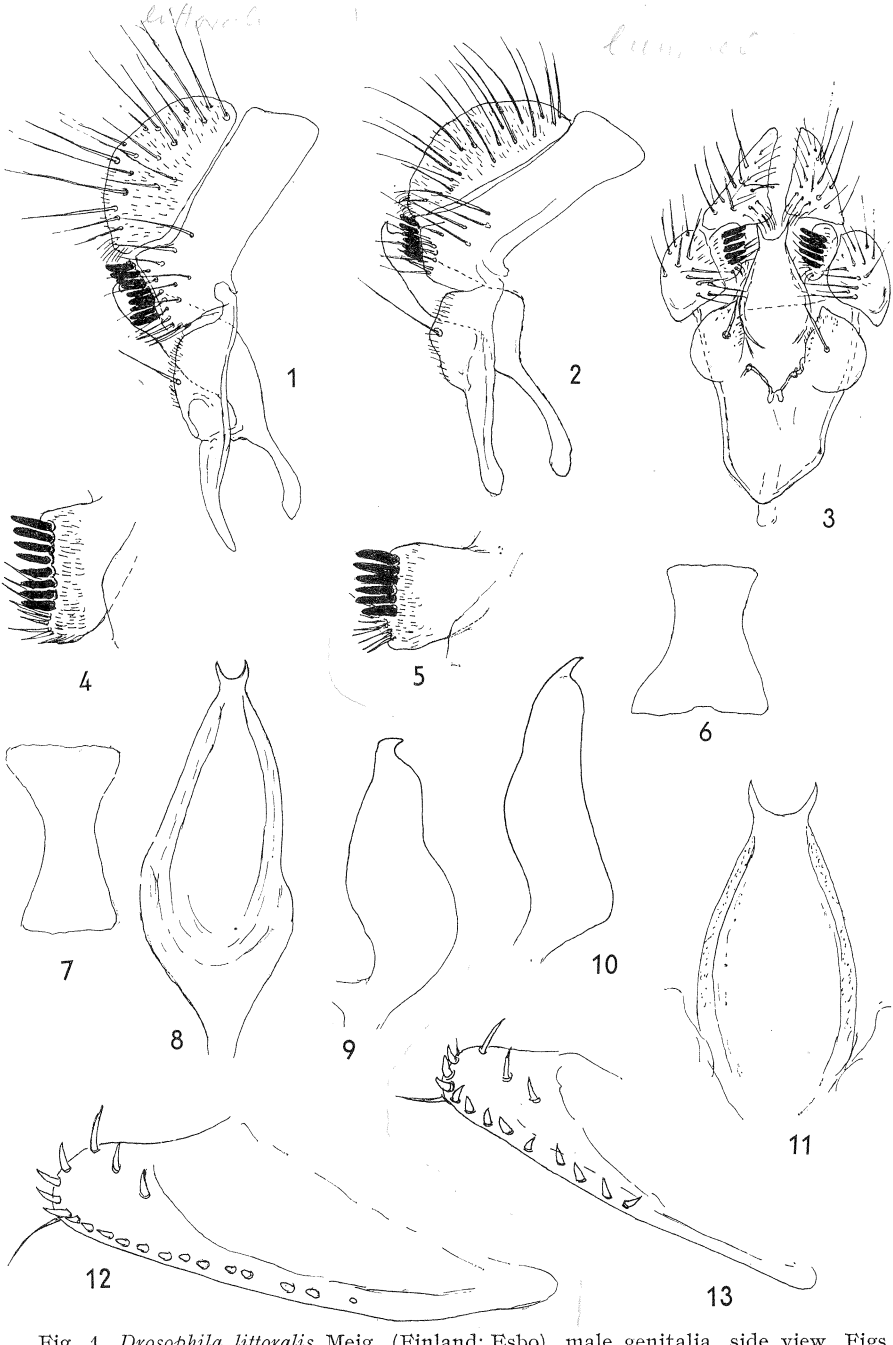

Fig. 1. *Drosophila littoralis* Meig. (Finland: Esbo), male genitalia, side view. Figs. 2—3. *D. lummei* sp.n. (Kuopio—Vaajasalo) male genitalia in side and ventral view. Fig. 4. *D. littoralis*, surstylus. Fig. 5. *D. lummei*, surstylus. Fig. 6. *D. lummei*, decasternum. Fig. 7. *D. littoralis*, decasternum. Figs. 8—9. *D. littoralis*, penis, dorsal view (specimen from Finland: Rovaniemi), side view (Esbo). Fig. 10—11. *D. lummei*, penis in side and dorsal view (Kuopio—Vaajasalo). Fig. 12. *D. littoralis*, ovipositor (♀ from Kuopio). Fig. 13. *D. lummei*, ovipositor (Kuopio—Vaajasalo).

Lakovaara. The holotype (pinned specimen, no. 14264) is preserved in the collection of the Zoological Museum, Helsinki. Paratypes, ♂♂ and ♀♀ from the same stock (no. 474) as the holotype, ♂♂ and ♀♀ from a stock from Sweden: Överkalix, started in 1970 (S. Lakovaara & W. Hackman) and 1 ♂ 1 ♀ from a stock from USSR: Moscow (stock received from Prof. Lynn Throckmorton).

Specimens of *D. lummei* from wild populations checked for isoenzymes (entire flies homogenized) were trapped in the following localities: *N:* Helsinki (668:38), 1 ♂ 24.VIII.1970 (S. Lakovaara), *Ta:* Tyrväntö (678:35) 1♂ 23.VIII. 1970, *Sb:* Kuopio—Vaajasalo (697:53) 1 ♂ 1 ♀, 1970 (S. Lakovaara).

Males agreeing morphologically with *D. lummei* have been found in samples from the following localities in Finland: *Ta:* Lammi (677:39) 1968 (K. Vepsäläinen), *Ob:* Jaatila (739:46) 1968 (S. Lakovaara), Kemijoki (740:51) 1968 (K. Vepsäläinen), *Ks:* Jäkälävuoma (736:60) 1968 (K. Vepsäläinen), Oulanka (736:60) 1968 (K. Vepsäläinen), *Li:* Inari (764:50) 1970 (P. Nuorteva).

In Kuopio—Vaajasalo *D. lummei* and *littoralis* were trapped together in 1971 (J. Immonen) and were both rather common in the sampling area not far from the Kallavesi lake shore. Sibling species usually occupy different niches if they occur in the same habitat (MAYR 1969:184). Further investigations are needed, however, to clear up this point in the case of these two species. In Kuopio—Vaajasalo *D. lummei* was trapped in 1971 from June 6 to the end of August (in all 17 ♂♂ identified) and of *littoralis* males were trapped from June 10 to September 2 (in all 22 ♂♂). The females could not be separated as to species. Obviously, there is no significant difference in phenology between *lummei* and *littoralis*. The occurrence in the Moscow area in USSR, indicates that *D. lummei* has a wide distribution eastward from Fennoscandia. The northward distribution within Fennoscandia is less clear because samples of flies of *D. lummei* type from Kuusamo and Finnish Lapland have not been investigated enzymatically and the question of whether a third species exists in the north (indicated by the Karesuando strain) is still unsettled.

I want here to acknowledge my thanks to Prof. Throckmorton of Chicago, who provided our team with a laboratory stock of *D. lummei* n.sp. from Moscow.

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