

## Drosophilidae (Diptera) from Korea\*

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**Abstract** — Taxonomic and faunistic studies of Drosophilidae from North Korea: of the 22 species one is new to science [*Drosophila (Sophophora) pappi* sp. n.] and the remaining 21 are new to N. Korea. — 2 figures.

Through courtesy of Dr. LÁSZLÓ PAPP, I have had an opportunity of studying specimens of Drosophilidae of North Korea collected by the expeditions of the Hungarian Natural History Museum in 1970–1971. The first expedition was undertaken by Dr. S. MAHUNKA and Dr. H. STEINMANN in May to June, 1970, and the second by Dr. J. PAPP and Dr. S. HORVATOVICH in August to September, 1971.

The collections comprise 419 flies, which belong to 22 species in 8 genera of Drosophilidae, including a new species of *Drosophila*. Only 3 species, *Drosophila busckii* COQUILLETT, *D. melanogaster* MEIGEN and *D. virilis* STURTEVANT, have hitherto been known from N. Korea, all recorded by KIKKAWA and PENG (1938). These 3 species are, however, not included in the present collections. As detailed collection data are given in MAHUNKA & STEINMANN (1971) and PAPP & HORVATOVICH (1972), merely major localities, with collection number in parentheses and number of specimens, are indicated for each species in the present report.

I am much obliged to Dr. L. PAPP for sending me the material and precise collection data. My hearty thanks are also due to Dr. S. MAHUNKA, Dr. H. STEINMANN, Dr. S. HORVATOVICH, and Dr. J. PAPP, for collecting the material.

### 1. *Leucophenga quinqueaculipennis* OKADA

*Leucophenga (L.) quinqueaculipennis* OKADA, 1956, Syst. Study Drosophilidae Jap.: 33  
 Specimen examined: Prov. Kengi, Bagyon san, Bagyon popo (Nr. 100), 1 ♂.  
 Distribution: N. Korea (new record), Japan.

### 2. *Microdrosophila purpurata* OKADA

*Microdrosophila purpurata* OKADA, 1956, Syst. Study Drosophilidae Jap.: 40.  
 Specimens examined: Prov. South Pyongan, De-sang san (Nr. 145), 1 ♂, Pyongyan, Pyongyan Hotel garden (Nr. 166), 1 ♀.  
 Distribution: N. Korea (new record), S. Korea, Japan.

### 3. *Chymomyza costata* (ZETTERSTEDT)

*Drosophila costata* ZETTERSTEDT, 1838, Ins. lapp.: 776.  
 Specimen examined: Prov. Ryang-gang, Chann-Pay plateau, Sam-zi-yan (Nr. 218), 1 ♂.  
 Distribution: N. Korea (new record), Europe, Japan.

\*Zoological Collectings by the Hungarian Natural History Museum in North Korea, No. 17.

4. *Scaptomyza (Parascaptomyza) pallida* (ZETTERSTEDT)

*Drosophila pallida* ZETTERSTEDT, 1847, Dipt. Scand., 6:2571.

Specimens examined: Prov. South Phenan, NE outskirts of Pyongyang (Nr. 13), 11 ♂, 10 ♀; (Nr. 15), 1 ♂, 1 ♀; Bong-ha ri (Nr. 19), 84 ♂, 66 ♀, 1 ex; Sa-gam po (Nr. 28), 1 ♀; (Nr. 29), 1 ♀; (Nr. 30.), 10 ♂, 11 ♀; (Nr. 31), 1 ♂, 1 ♀. — Prov. Kanwon, Wonsan (Nr. 44), 20 ♂, 42 ♀; (Nr. 45), 1 ♀; Si-sung-ho Nr. 49), 7 ♂, 6 ♀; Kum-gang san, Sam-il po (Nr. 87), 2 ♂, 1 ♀. — Prov. South Pyongan, Pyongyan Hotel garden (Nr. 142), 1 ♂, 2 ♀; (Nr. 156) 2 ♀; (Nr. 162), 1 ♀; (Nr. 166), 1 ♀; Za-mo san (Nr. 231), 1 ♀; De-sang san (Nr. 145) 6 ♂, 9 ♀; Chang-lyong san (Nr 172), 1 ♀; City park between river Tedong ang Pyongyan Hotel (Nr.227), 1 ♂, 3 ♀. — Prov. Ryang-gang; Hyesan, Hyesan Hotel garden (Nr. 193) 2 ♂, 2 ♀; Chann-Pay plateau, Sam-zi-yan (Nr. 198), 1 ♀; (Nr. 205), 1 ♀; (Nr. 218) 1 ♀. Loc. inc. (White label), 6 ♂, 4 ♀.

Distribution: N. Korea (new record), Cosmopolitan.

5. *Scaptomyza (Scaptomyza) polygonia* OKADA

*Scaptomyza (Scaptomyza) polygonia* OKADA, 1956, Syst. Study Drosophilidae Jap.: 74.

Specimens examined: Prov. South Phenan, Bong-ha ri (Nr. 19), 4 ♂, 1 ♀. — Prov. Kanwon, Wonsan (Nr. 44), 1 ♀; Si-sung-ha (Nr. 49), 2 ♀. Loc. inc. (White label), 1 ♀.

Distribution: N. Korea (new record), S. Korea, Japan.

6. *Drosophila (Hirtodrosophila) confusa* STAEGER

*Drosophila confusa* STAEGER, 1844, Naturhist. Tidskr., 1:18.

Specimens examined: Prov. Ryang-gang, Chann-Pay plateau, Sam-zi-yan (Nr. 198), 3 ♀.

Distribution: N. Korea (new record), S. Korea, Europe, Japan.

7. *Drosophila (Hirtodrosophila) sexvittata* OKADA

*Drosophila (Hirtodrosophila) sexvittata* OKADA, 1956, Syst. Study Drosophilidae Jap.: 78

Specimens examined: Prov. Ryang-gang, Chann-Pay plateau, Sam-zi-yan (Nr. 198), 1 ♂; (Nr. 201), 2 ♂; (Nr. 206), 1 ♂, 4 ♀; (Nr. 209), 1 ♂, 2 ♀.

Distribution: N. Korea (new record), S. Korea, Japan.

8. *Drosophila (Hirtodrosophila) alboralis* MOMMA & TAKADA

*Drosophila (Hirtodrosophila) alboralis* MOMMA TAKADA, 1954, Annot. zool. jap., 27:98,

Specimens examined: Prov. Ryang-gang, Hyesan, Hyesan Hotel garden (Nr. 193), 1 ♂; Chann-Pay plateau, Sam-zi-yan (Nr. 201), 1 ♂, 1 ♀; (Nr. 206), 1 ♀; (Nr. 209), 1 ♂, 2 ♀.

Distribution: N. Korea (new record), S. Korea, Japan.

9. *Drosophila (Sophophora) bifasciata* POMINI

*Drosophila bifasciata* POMINI, 1940, Bol. Ist. Ent. R. Univ. Bologna, 12:155.

Specimen examined: Prov. Ryang-gang, Chann-Pay plateau, Sam-zi-yan (Nr. 209), 1 ♂.

Distribution: N. Korea (new record), S. Korea, Europe, India, Japan.

10. *Drosophila (Sophophora) alpina* BURLA

*Drosophila alpina* BURLA, 1948, Rev. Suiss. Zool., 55:274.

Specimen examined: Prov. Ryang-gang, Chann-Pay plateau, Sam-zi-yan (Nr. 209), 1 ♀.

Distribution: N. Korea (new record), Mongolia, Europe, Japan.

11. *Drosophila (Sophophora) auraria* PENG

*Drosophila auraria* PENG, 1937, Annot. zool. jap., 16:23.

Specimens examined: Prov. South Pyongan, De-sang san (Nr. 145), 2 ♂, 1 ♀. Pyongyan Hotel garden (Nr. 166), 1 ♂, 1 ♀; (Nr. 243), 2 ♀; City park between river Te-dong and Pyongyan Hotel (Nr. 227), 2 ♂, 1 ♀.

Distribution: N. Korea (new record), S. Korea, China, Japan.

12. *Drosophila (Sophophora) triauraria* BOCK & WHEELER

*Drosophila (Sophophora) triauraria* BOCK & WHEELER, 1972, Univ. Texas Pub., 7213:54.

Specimens examined: Prov. South Pyongan, De-sang san (Nr. 145), 2 ♂; Pyongyan Hotel garden (Nr. 162), 1 ♀; (Nr. 188), 2 ♀; City park between river Te-dong and Pyongyan Hotel (Nr. 227), 1 ♂, 2 ♀; Za-mo san (Nr. 213), 1 ♂.

Distribution: N. Korea (new record), S. Korea, Japan.

13. *Drosophila (Sophophora) clarofinis* LEE

*Drosophila (Sophophora) clarofinis* LEE, 1959, Korea. J. Zool., 2:43.

Specimen examined: Prov. South Pyongan, Za-mo san (Nr. 231), 1 ♀.

Distribution: N. Korea (new record), S. Korea.

14. *Drosophila (Sophophora) nipponica* KIKKAWA & PENG

*Drosophila nipponica* KIKKAWA & PENG, 1938, Jap. J. Zool., 7: 531.

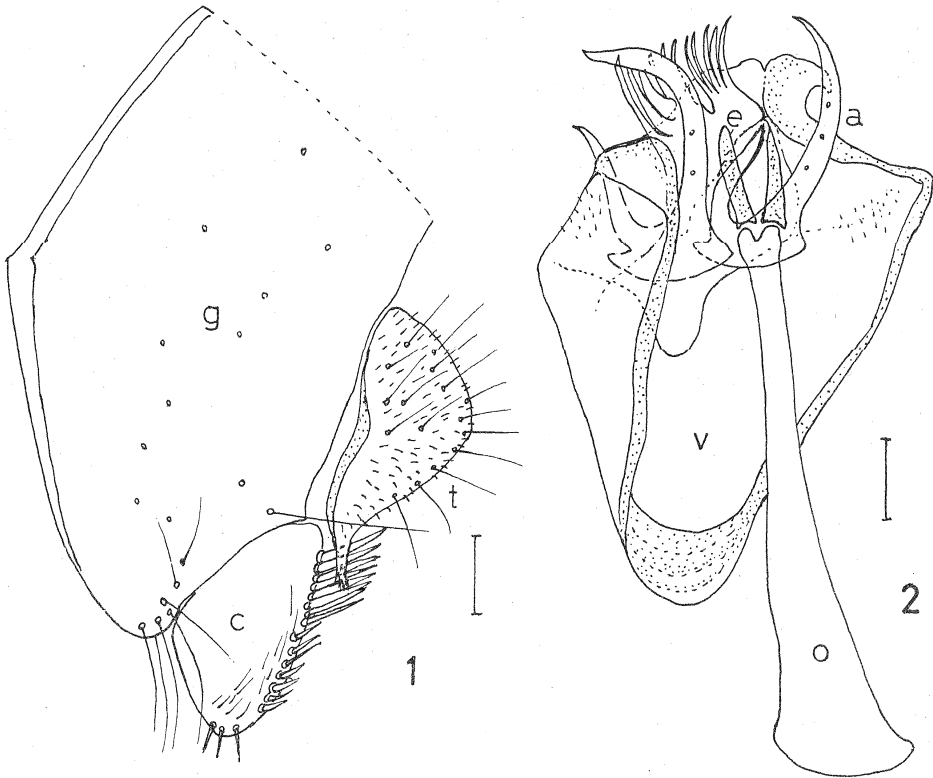
Specimens examined: Prov. South Phenan, Bong-ha ri (Nr. 19), 2 ♀. — Prov. Ryang-gang, Chann-Pay plateau, Sam-zi yan (Nr. 198), 1 ♀.

Distribution: N. Korea (new record), S. Korea, Japan.

15. *Drosophila (Sophophora) pappi* sp. n. (Figs. 1—2)

♂. Body about 2.5 mm in length, dark brown. Head as broad as thorax. Eye red, with thick piles. Antenna yellowish brown, third joint paler and distally rounded. Arista with 4 dorsal and 2 ventral branches in addition to a moderate fork. Palpus slender, yellowish brown, with a stout terminal seta. Ocellar and frontal triangle mat black. Periorbits reddish brown, broad. Front black, anteriorly reddish brown and broader than length down middle. Clypeus black. Face greyish brown, flat. Carina high but short. Cheek brownish black, 1/6 as broad as the largest diameter of eye. Anterior reclinate orbital minute, just behind proclinate; proclinate half as long as posterior reclinate. Vibrissa strong, 2nd oral slightly shorter but much thinner than vibrissa.

Mesoscutum and scutellum mat brownish black, pollinose in grey. Scutellum distally rounded, without marginal ridge. Thoracic pleura paler than mesonotum. Acrostichal hairs in 4—6 rows. Humerals strong. Anterior dorsocentrals half posterior; distance between anterior and posterior pairs about 3/4 distance between anterior pair. Posterior scutellars 3/4 as long as anteriors, which are convergent. Sterno-index 0.3. Legs yellow, ultimate tarsal joints fuscous. Preapicals on all tibiae, apicals prominent on mid. Wing hyaline, veins pale.  $R_{2+3}$  gently curved to costa distally,  $R_{4+5}$  and  $M$  parallel.  $C$ -index 2.7;  $4V$ -index 1.8;  $5x$ -index 2.0,  $Ac$ -index 2.3.  $C1$ -bristles two, unequal;  $C3$ -fringe on basal 1/3. Haltere white. Abdominal tergites and sternites black,  $17'$  yellowish brown.



Figs. 1-2. *Drosophila (Sophophora) pappi* sp. n. ♂: 1 = peripheralia, lateral aspect; 2 = phallic organs, ventro-lateral aspect; a = anterior paramere, c = clasper, e = aedeagus, g = genital arch, o = apodeme of aedeagus, t = anal plate, v = ventral fragma. Scales 0.1 mm.

Peripheralia (Fig. 1): Genital arch (g) black, broad, caudolaterally gently angulated, ventrally rounded. Clasper (c) black, oval, projected below genital arch, distally with a row of about 15 strong bristly teeth, the teeth of dorsal half of the row very long. Anal plate (t) pale, setigerous and pubescent, ventrally exceedingly narrowing and terminated by a few short strong bristles. Peripheralia (Fig. 2) generally black. Aedeagus (e) complicate, distally with several long finger-like serrations; apodeme more than twice as long as aedeagus, proximally much dilated. Anterior paramere (a) deeply bifurcated. Ventral fragma (v) triangular, with a shallow median notch.

Distribution: N. Korea.

Holotype: ♂, Prov. Ryang-gang: Chann-Pay plateau, Sam-zi yan, 1600 m, 25 Aug. 1971 - Caught in Malaise-trap (Nr. 198). In the Hungarian Natural History Museum, Budapest.

Relationships: Closely resembling *D. mommai* TAKADA & OKADA from Japan, but differs in less prominently pointed lateral border of genital arch, much more deeply bifurcated anterior paramere, and more complicatedly serrated aedeagus.

16. *Drosophila (D.) testacea* VAN ROSER, 1840

*Drosophila testacea* VAN ROSER, 1840, Württemb. Corrb. l.: 62.

Specimens examined: Prov. Ryang-gang, Chann-Pay plateau, Sam-zi-yan (Nr. 198), 2 ♂; (Nr. 205), 1 ♂, 1 ♀; (Nr. 206), 1 ♂.

Distribution: N. Korea (new record), S. Korea, Mongolia, India, Europe, Japan.

17. *Drosophila (D.) bizonata* KIKKAWA & PENG

*Drosophila bizonata* KIKKAWA & PENG, 1938, Jap. J. Zool., 7:532.

Specimen examined: Prov. Kaesong, Mts. Pakyon, Pakyon popo (Nr. 249), 1 ♂.

Distribution: N. Korea (new record), S. Korea, Japan, Hawaii (introduced from Japan).

18. *Drosophila (D.) angularis* OKADA

*Drosophila (D.) angularis* OKADA, 1956, Syst. Study Drosophilidae Jap.: 128.

Specimens examined: Prov. Kanwon, Kum-gang san, Go-song chon (Nr. 69), 1 ♀. — Prov. Kengi, Bagyon san, Bagyon popo (Nr. 100), 1 ♂. — Prov. South Pyongan, Pyongyan, Pyongyan Hotel garden (Nr. 142), 1 ♀. — Prov. Ryang-gang, Chann-Pay plateau, Sam-zi-yan (Nr. 218), 1 ♂.

Distribution: N. Korea (new record), S. Korea, Japan.

19. *Drosophila (D.) unispina* OKADA

*Drosophila (D.) unispina* OKADA, 1956, Syst. Study Drosophilidae Jap.: 129.

Specimens examined: Prov. Ryang-gang, Chann-Pay plateau, Sam-zi-yan (Nr. 209), 2 ♂.

Distribution: N. Korea (new record), S. Korea, Japan.

20. *Drosophila (D.) nigromaculata* KIKKAWA & PENG

*Drosophila nigromaculata* KIKKAWA & PENG, 1938, Jap. J. Zool., 7: 537.

Specimens examined: Prov. South Phenan, Bong-ha ri (Nr. 19), 3 ♂, 2 ♀. — Prov. South Pyongan, De-sang san (Nr. 145), 1 ♂, 2 ♀; Pyongyan, Pyongyan Hotel garden (Nr. 156), 1 ♀.

Distribution: N. Korea (new record), S. Korea, Japan,

21. *Drosophila (D.) histrio* MEIGEN

*Drosophila histrio* MEIGEN, 1830, Syst. Besch., 6: 85.

Specimens examined: Prov. Ryang-gang, Chann-Pay plateau, Sam-zi-yan (Nr. 198), 2 ♀; (Nr. 201), 2 ♂, 3 ♀; (Nr. 209), 5 ♂; (Nr. 218), 1 ♂, 1 ♀.

Distribution: N. Korea (new record), S. Korea, China, Europe, Japan.

22. *Drosophila (D.) funebris* (FABRICIUS)

*Musca funebris* FABRICIUS, 1788, Mant. Ins., 2: 345.

Specimen examined: Prov. Ryang-gang, Chann-Pay Plateau, Sam-zi-yan (Nr. 209), 1 ♀.

Distribution: N. Korea (new record), Mongolia, Europe, Japan, Africa, Azores, Australia, New Zealand, Canada, N. America, Central America.

### Note on the geographical distribution

At present the Drosophilid fauna of N. Korea comprises 25 species: 3 hitherto recorded and 22 newly found. Of these species, 22 (88%) are common to Japan, 21 (84%) to S. Korea, and 10 (40%) to Europe. Of 10 species common to Europe, 4 are cosmopolitan, 6 Eurasian. *Drosophila virilis* is also holarctic, though absent from Europe. All of the 6 Eurasian species are extending their distribution to Japan, but 2 of them (*Chymomyza costata* and *D. alpina*) were not yet found in S. Korea. Thirteen species are East-Asiatic, all extending into Japan, except one (*D. clarofinis*) which is limited to S. as well as N. Korea. The species endemic to N. Korea is at present only one (*D. pappi*), the endemism being 4%.

Nearly a hundred species belonging to 9 genera of Drosophilidae have hitherto been recorded from S. Korea (LEE 1966). About 8.3% of them are endemic to that area, the endemism being twice higher than in N. Korea. Another 8.3% of the S. Korean species are of Oriental element, while none in N. Korea (Table I).

*Scaptomyza pallida* was exceedingly predominant in frequency, running to 323 examples, representing 77% of the total collection (419 ex.) All of the remaining species were very low in frequencies, even the highest being only 3.3% (*D. histrio*).

Biogeographical elements of the Drosophilid fauna of N. Korea, as compared to that of S. Korea

Elements	North Korea		South Korea	
	Number of species	%	Number of species	%
Endemic	1	4.0	8	8.3
Holarctic	1	4.0	1	1.1
Cosmopolitan	4	16.0	8	8.3
Eurasian	6	24.0	11	11.4
East-Asiatic	13	52.0	60	62.6
Oriental	0	0.0	8	8.3
Total	25	100.0	96	100.0

Also in S. Korea, *S. pallida* shows a high abundancy, but does not exceed *D. auraria* (*D. biauraria* and *D. triauraria* included) and *D. angularis* (according to data given by LEE, 1964). The abundant occurrence of *S. pallida* in N. Korea seems to reflect the dominancy of herbaceous edaphic environments.

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