XII. THE SUBGENUS PHOLADORIS (DROSOPHILA) WITH DESCRIPTIONS OF TWO NEW SPECIES

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The subgenus Pholadoris was established by Sturtevant (1942) who characterized it as follows: "Shining dark species; prescutellars present; a V-shaped shining bristle-bearing area on front; egg filaments 6 to 8; posterior Malpighian tubes apposed at distal ends; testis short, not coiled; ventral receptacle short, not coiled or kinky; skipping larvae." He stated further that it included *D. victoria* Sturtevant, which he designated as the type species, and *D. coracina* Kikkawa and Peng as well as "a number of undescribed forms."

It is the purpose of the present paper to describe two new members of the subgenus, to redefine the characters which separate it from the other subgenera of Drosophila, and to establish two species groups within the subgenus, namely, the victoria and the mirim species groups.

The writer wishes to express his appreciation to Dr. Sarah Bedichek Pipkin who contributed the stock of *D. lebanonensis*, n.sp., from Beirut, Lebanon, and to Dr. M. J. D. White who prepared a translation of the paper of Buzzati-Traverso (1943) for our use.

DESCRIPTIONS OF THE NEW SPECIES

Drosophila lebanonensis, sp. nov.

External characters of imagines.

♂, ♀. Arista with about 7 branches, two below in addition to the terminal fork. Antennae dark tan, third joint much darker. Face and front dark tan, ocellar triangle and orbits darker, nearly black. Upper series of frontal hairs arranged in a V, the bristle-bearing area not shiny. A single prominent oral bristle, the 2nd little more than ⅓ length first. Middle orbital about ¼ the other two, the posterior one but little longer than the anterior. Carina short, widely expanded below, bulbous and rounded, not sulcate. Palpi light tan with 3–4 prominent hairs. Cheeks dark yellowish gray, their width about ⅙ greatest diameter of eyes; 4–5 prominent bristles at lower angle of cheek. Eyes dark red with short, dark pile.

Acrostichal hairs in 6 obvious rows; in many individuals there is another row on each side in the proper region which, however, stops just before reaching the level of the anterior dorsocentrals. Four bristles in prescutellar row, the median pair definitely enlarged. Anterior scutellars divergent. Three well-developed sternopleurals, the middle one thin, about ½ length posterior; sterno-index about .7. Halteres pale. Mesonotum and scutellum dark brown, shining, without marking. Legs dirty grayish yellow, first pair darkest; femora darker. Apical bristles on 1st and 2nd tibiae, preapicals on all three.

Abdominal tergites dark and shining, the basal two slightly less so and somewhat paler centrally. Sternites dark. Male hypopygium retracted into abdomen so that the terminal end of the abdomen appears cut off when viewed from above. The external male genitalia are figured and described by Hsu (this bulletin).

Abdomen of female shining yellow with broad dark brown bands, that of first tergite a little lighter in mid-line. The band of the first complete tergite reaches the margin, the entire tergite appearing dark; on the following tergites the anterior corners become yellow, progressively as one proceeds posteriorly, this area on the 5th complete tergite extending well towards the mid-line from either side. The circum-anal tergite is quite yellow in its mid-region, the dark bands failing to reach the margin. Anterior median sternite lightly pigmented, the other four extremely pale. Ovipositor yellowish tan.

Length, male: body: 2.7 mm. (in live specimen); wing: 2.5 mm.

Female: body: 3.0 mm., wing: 2.8 mm.

Internal characters of imagines.

Testes elliptical; dark, dull yellow in color.

Ventral receptacle a short, finger-like pocket, bent back upon itself once about the middle. Spermathecae with chitinized centers.

Anterior Malpighian tubes much longer than posterior, the common stalks of each about 1/10 their total length; tips of anterior tubes free, those of posterior apposed without the formation of a continuous lumen.

Other characteristics, relationship, and distribution.

Eggs.—With 6 to 10 filaments, about 90% with 7–8. Tips of filaments tend to be curly.

Larvae.—White in color; skip.

Puparia.—Light tan. Each anterior spiracle with 5–6 branches. Stalk of anterior spiracles extremely short, the branches seeming to arise from the edge of the puparium itself. Posterior spiracles tightly parallel. Pupation is in or near the cotton plug in laboratory vials.

Chromosomes.—Metaphase plate shows 2 pairs of large V's, one pair of medium-sized V's, and a pair of rod-shaped X-chromosomes; the rod-shaped Y is shorter than the X (det. by C. Ward).

Relationship.—Belongs to the subgenus Pholadoris wherein it seems to be most closely related to *D. nitens* from Italy and *victoria* from North America. Hybrids can be produced in crosses with the latter.

Distribution.—The only record is Beirut, Lebanon where it was collected by Dr. Sarah Bedichek Pipkin who very kindly sent a stock to this laboratory.

Types.—Holotype male and and a series of paratype males and females, No. 1733.1. These specimens, as well as the types of the other new species described in this article, have been placed in the Drosophila Type and Reference Collection of The University of Texas, Austin, Texas.

Drosophila baeomyia, sp. nov.

External characters of imagines.

♂. Arista with about 8 branches, two below in addition to the terminal fork; branches rather long, slender, bent terminally at their tips, those nearest base bent most strongly. Antennae light tan, third joint a little darker. Face and front light tan, orbits and ocellar triangle on dead flies much lighter, appearing almost silvery white. Upper series of frontal hairs somewhat enlarged, arranged in 2 nearly parallel rows, converging slightly below. One prominent oral bristle, the 2nd scarcely developed. Anterior reclinate orbital about as far forward as proclinate, about ⅓ length other two. Carina long, slender, evenly rounded throughout its length. Palpi pale, with about 3 prominent hairs. Cheeks pale yellowish gray, quite narrow, about 1/8–1/10 greatest diameter of eyes. Two prominent bristles at lower angle of cheek. Eyes light red with short, light pile.

Acrostichal hairs in 8 rows, a bit irregular in males. A single pair of hairs in prescutellar row, this pair noticeably enlarged. Anterior scutellars strongly convergent. Halteres pale. Anterior dorsocentrals slightly less than ½ length posterior, and about 5/6 length anterior scutellars. Three prominent sternopleurals, the two dorsal ones about equal in length and rather closely appressed to pleura; ventral one below and posterior to middle one, standing at an angle to pleura. Mesonotum and scutellum light yellowish brown, slightly shining, without markings. Legs pale yellow; a few short recurved hairs on fore tarsi. Apical bristles on 1st and 2nd tibiae, that of 1st short; preapicals on all three.

Abdomen yellow, each segment with an apical black band, widely interrupted on first segment, merely notched on the 2nd, and uninterrupted on remaining segments. Band of 1st tergite reaches the angle only, on the next two it continues nearly to the margin, and reaches it completely on the remaining two. Bands of last two tergites shining, previous ones rather dull. Sternal plates pale. The external genitalia are figured and described by Hsu (this bulletin).

♀. Same as male except for abdominal coloration. Abdominal bands of first visible tergite rather pale, noticeably interrupted, fading away just before reaching the angle; that of 2nd segment narrowly interrupted, about ½ width of tergite but widening at the angle to base of previous tergite; band of 3rd as on 2nd except that interruption is reduced to a mere notch; band of 4th continuous across mid-region, often slightly wider in mid-line but does not bend toward previous segment; bands of all these tergites fail to reach the lateral margin but that of the next, and last, complete tergite reaches the margin along the posterior ⅔ of the lateral edge; this band is nearly as wide as the tergite and is shining black, as is the circum-anal tergite. On all segments the yellow areas are shiny but the dark bands of the first four tergites are dull. The last five sternal plates are quite pale and bristled; the first one is darker, its posterior half strongly bifid, each lobe thus formed with one prominent bristle, directed posteriorly, and 2–3 short, inconspicuous hairs. Obipositor pale tan.

Wings clear, costal bristles dark. Costal index about 1.5–1.6; 4th vein index about 2.2; 5x index about 2.0. Two bristles at distal costal break. Third costal section with heavy bristles on its basal ⅔ or slightly more.

Length, male: body: 1.7 mm. (in live specimen); wings: 1.5 mm.

Female: body: 2.0 mm.; wing: 1.7 mm.

Internal characters of imagines.

Testes elliptical; pale lemon yellow.

Ventral receptacle quite small, scarcely as long as stalk of spermathecae, consisting of a thick-walled basal half with narrow lumen and thin-walled distal half with large lumen, the organ bent near its middle to form a tight U, closely appressed to the outer tissues of the vagina. Spermathecae rather large, with small, heavily chitinized centers.

Anterior Malpighian tubes much longer than posterior, their common stalk about ⅓ the total length; posterior tubes with their ends apposed without the formation of a continuous lumen, their common stalk about ½ the total length.

Other characteristics, relationship, and distribution.

Eggs.—With 2 to 8 filaments, counts of 5, 6, and 7 being most common.

Larvae.—Pale lavender in color; skipping observed but rarely.

Puparia.—Light tan; no measurable stalks on anterior spiracles, each with about 4 very short branches. Posterior spiracles tightly parallel.

Chromosomes.—Metaphase plate shows 3 pairs of V's with no rods or dots (determined by C. Ward and T. C. Hsu).

Relationship.—Belongs to the subgenus Pholadoris wherein it seems to be quite closely related to *D. mirim* from Brazil. Since a stock of the latter has not been available for comparison there is a possibility that these two forms are identical, although in this case the discontinuity of their distributions would be remarkable.

Distribution.—This new species has been captured in small numbers in the states of Jalisco, Michoacan, Nuevo Leon, Mexico, and Oaxaca, Mexico, in the summer of 1947 by Mr. F. A. Cowan and the writer, and along the Santee River, near Georgetown, South Carolina, in July, 1948, by Mr. T. C. Hsu and the writer.

Types.—Holotype male and paratype males and females (No. 1808.6) from the valley of the Rio Tehuantepec, Oaxaca, Mexico.

Notes.—Nothing is known of the food habits of this species, but it is of interest that the largest collection (19 flies) was from traps situated in a tourist court in the city of Monterrey, N. L., Mexico. The name means tiny fly.

MEMBERS OF THE SUBGENUS

The following summary of the various species which are here assigned to the subgenus Pholadoris is to be taken as tentative, since it is realized that several more species, as yet undescribed, belong to this group.

Drosophila victoria Sturtevant 1942:33–34.

This species, which Sturtevant designated as the type of the subgenus, has a very extensive distribution throughout the western United States and Mexico. Sturtevant has reported it from several places in California and collectors from this laboratory have trapped it in such widely scattered places as north-eastern Montana, the states of Durango, Guerrero, and Chihuahua, Mexico, and the Pecos River in West Texas. Dr. D. D. Miller (private communication) has reported it from Lincoln, Nebraska, the most eastern record to date.

It frequently builds up large populations along river banks and seems always to be closely associated with cottonwood trees (*Populus* spp.) on which adults have frequently been captured feeding on exuding sap. It seems possible that the entire life cycle takes place in such sap flows, in fact, the writer has reared adults of this species from larvae extracted from bleeding sap on trees along the Sonoita River, near Patagonia, Arizona. The largest collection of this species in our records is the capture of 1420 adults out of a total of 1724 Drosophila along the Gila River near Cliff, New Mexico. On the other hand many collections have yielded surprisingly few specimens, as for example, the capture of a single fly among a total of 4,835 Drosophila near Taxco, Guerrero, Mexico. Collectors have noticed that whereas large numbers of adults of this species come to traps in the evening, relatively few are captured in the morning.

Two color phases of *D. victoria* are known; the most frequent color is a shining dark brownish black, but occasionally entire populations are a shining auburn brown. Crosses between these two color phases are quite fertile and indicate that the black coloration is incompletely dominant to the brown.

Drosophila coracina Kikkawa and Peng 1938:523–524.

On the basis of the characteristics given in the published description of this species, Sturtevant was able to assign it unquestionably to the subgenus Pholadoris. The describers reported having captured this species at Simoda and Kyoto on the island of Hondo, Japan, and state that it feeds on decaying fruit and the sap of bleeding trees. Tan, Hsu and Sheng (this bulletin) report the capture of this form at Hangchow, on the coast of China, and at Meitan, more than 1000 miles inland, indicating that it is a widely distributed Oriental species.

Drosophila nitens Buzzati-Traverso 1943:2–8.

The characters of this form indicate that it belongs to the subgenus. Buzzati-Traverso indicated its similarities to *D. coracina* as well as to *florae* and *bromeliae, Paradrosophila* (of Duda) and to certain groups of the Sophophora, but he did not assign it to any of the recognized subgenera. He stated that this species had been collected at six places in lower Italy by means of traps in wooded country. One collection is stated to have been made in a house.

More recently, Burla (1948) has reported the capture of *D. nitens* in Switzerland. He has also indicated that his new species, *D. guyenoti,* is similar in several respects to *nitens.* Specimens of *guyenoti,* sent to us by Mr. Burla, have been carefully examined and do not seem to belong to this subgenus.

Drosophila lebanonensis n. sp.

As mentioned earlier, this stock was sent to us in April, 1948, by Dr. Sarah Bedichek Pipkin who collected it near Beirut, Lebanon. It clearly belongs to the subgenus and appears to be most closely related, morphologically, to *D. nitens.*

Drosophila mirim Dobzhansky and Pavan 1943:62–64.

This species, although not assigned to the subgenus by the describers, seems to the writer to exhibit a sufficient number of characteristics to warrant its inclusion. It is distinctly different from the preceding species, however, so that the erection of a separate species group seems advisable. As in the case of *D. nitens,* the authors point out the similarities to *D. bromeliae,* and also remark on the similarity of the wing to that of *D. glabrifrons* but state that it "clearly does not belong to the subgenus Hirtodrosophila." This species is known at present only from Bertioga, state of Sao Paulo, Brazil.

Records of undescribed species.

Several undescribed forms, obviously belonging to the subgenus, have been observed at various times by collectors. One "black victoria-like" fly is recorded in the collection data of this laboratory from a fruit store, Mexico City, 6–24–43; the collector was G. B. Mainland. Two females, quite possibly the same species as the above, were taken by the writer from a trap in Mexico City in August, 1947. Patterson and Wagner (1943) reported single specimens from Colorado and Wyoming, both recalled to have been dark and shiny like *victoria.* Two further records, although not certainly of a victoria-like species, may be mentioned. One fly, recorded as "n.sp., shining black," from Tampico, Mexico, and four others, believed by the collector to be the same, recorded as "small shining dark fly," from Sedeño Canyon, Vera Cruz, Mexico, were captured in August, 1943, by G. B. Mainland.

As mentioned later in the summary, two species described by Malloch (1934) from Samoa may perhaps also belong to the subgenus.

CHARACTERISTICS OF THE SUBGENUS

External morphology of imagines.

1. Body color. On the basis of the species available to him, Sturtevant stated that the members of the subgenus were "shining dark species." The inclusion of *D. mirim* and *baeomyia,* however, makes this description applicable only to the victoria species group since these two forms are both yellow flies with dark abdominal markings and are not noticeably shining.

2. Acrostichal hairs. The number of these hairs is stated by Sturtevant to be 6 in *D. victoria;* in *D. coracina* there are said to be 8; this character is omitted, probably through an oversight, from the description of *D. nitens;* there are 6 clearly marked rows in *D. lebanonensis; D. mirim* is stated to have 8 regular rows, and there appear to be 8 such rows in *D. baeomyia,* although they are somewhat irregular in males. On the basis of the above, it may be said for the present that the victoria species group seems to possess 6 rows of acrostichals, that *D. coracina* is exceptional with 8, and that the mirim species group characteristically possesses 8 such rows.

3. Prescutellar bristles. All of the species listed earlier possess a pair of differentiated prescutellar acrostichals. This character was originally listed by Sturtevant as one of those diagnostic of the group.

4. Anterior scutellar bristles. These bristles are divergent in *D. victoria* and *lebanonensis,* are definitely convergent in *D. baeomyia* and *mirim,* and are not mentioned in the descriptions of *D. coracina* or *nitens.* They may be presumed to be divergent in the latter species, however, since *D. guyenoti* is said by Burla to have divergent scutellars and also to be very similar to *D. nitens.*

5. Sterno-index. Sturtevant stated that the sterno-pleural index was high (0.8–0.9) in Pholadoris. This seems to be consistent throughout the subgenus, the shortest anterior sterno-pleural (index: 0.7) being found in *D. victoria.* This ratio is not available for *D. coracina* nor *nitens.*

6. Wing vein indices. Two remarks by Sturtevant typify the group in this respect: costal index less than 2.0 in Pholadoris; values as high as 2.0 for the 4th vein index rare except in Pholadoris and a few other forms. The range of these indices within the subgenus is as follows: costal index from 1.1 (in *D. mirim* which is a bit variable for this character) to 2.2 (in *D. nitens,* according to Buzzati-Traverso). 4th vein index from 2.2 to 2.4 in all species except *D. lebanonensis* (2.8). 5x index from 1.4 in *D. victoria* to 2.4 in *D. mirim,* although indices as low as 2.0 are also encountered in this species.

7. Costal bristles. All members of the subgenus have two prominent bristles at the distal costal break, as do most members of the genus. All members possess heavy costal bristles on the basal $\frac{3}{4}$ to $\frac{3}{5}$ of the third costal section.

8. Arista. Although not included in his diagnosis of the subgenus, Sturtevant mentioned that the number of branches of the arista was 7 in *D. victoria,* this being the lowest number in the genus. This appears to be a group characteristic since *D. coracina* has 7, *nitens* has 8, *lebanonensis* has 7, *mirim* has 8–9 and *baeomyia* has 8. Another character which should be mentioned here is the presence of just two (sometimes three in *D. mirim*) branches below in addition to the terminal fork.

9. Middle orbital bristle. This bristle is quite short in all members of the subgenus (e.g., $\frac{1}{3}$, $\frac{1}{4}$, $\frac{1}{5}$) except *D. coracina* in which it is said to be $\frac{1}{2}$ the length of the other two.

10. Vibrissa. The first oral bristle is relatively large and prominent in all the members of the subgenus, the second being about ½ the length of the first in *D. victoria,* ⅓ or ¼ that length in the other species.

11. Carina. Sturtevant stated that the carina was rather broad in Pholadoris although Kikkawa and Peng, in describing *D. coracina,* stated: "Carina narrow and slightly flat." A comparison of this character in the other species leads us to believe that too much specific variability is present to include it as a group character. In the other species the carina is described as follows: *D. nitens:* high and nose-shaped; *mirim:* large, prominent and rounded; *lebanonensis:* high and bulbous; *baeomyia:* long, slender and rounded.

12. Cheeks. Sturtevant stated that the cheeks were narrow in Pholadoris and described this character in *D. victoria* as follows: "scarcely ⅙ greatest diameter of eye." This figure is given as 1/7 for *D. coracina,* as about ⅙ in *lebanonensis* and *nitens,* while in *mirim* it is ⅛ and in *baeomyia* 1/8–1/10, perhaps indicating that in the mirim species group the cheeks are a little narrower than in the other members of the subgenus.

13. V-shaped bristle-bearing area of front. Although this character was not mentioned by Kikkawa and Peng in their description of *D. coracina,* it seemed sufficiently important to Sturtevant with respect to *D. victoria* (the species was named for this character) that he listed it as one of the diagnostic characters of the subgenus. In *D. victoria, lebanonensis* and *nitens* (judging from the figure of this species published by Burla) this upper series of frontal hairs is definitely enlarged, originates rather high up on the front and is arranged in an obvious V. The area bearing these bristles is shiny in *D. victoria* but it not noticeably shiny in *D. lebanonensis.* In *D. baeomyia,* on the other hand, this series of hairs is smaller, originates at a somewhat lower point and is arranged in two nearly parallel rows, showing, none-the-less, a tendency for these rows to converge below.

14. External male genitalia. A comprehensive survey of the structure of the external genitalia of male Drosophila is given by Hsu (this bulletin), who has carefully described and figured the genital arch, anal plate and claspers of the members of the subgenus Pholadoris. A brief summary is included here for completeness.

In the victoria species group information is available for *D. victoria, lebanonensis, coracina* and *nitens* (drawing of Buzzati-Traverso). With the exception of *D. coracina,* which will be referred to later, all these forms agree in the following characteristics:

a. Genital arch broad and rounded below, with a prominent projecting horn-like process on the heel, i.e., lower anterior angle; the arch heavily bristled below.

b. Anal plate not attached to the genital arch, covered with dense bristles, especially dense at the lower tip.

c. Clasper with a single row of primary teeth, no secondary teeth, the lower portion extended outward beyond the lower teeth; a number of finer hairs on the remaining outer surface.

In the mirim species group information is available only for *D. baeomyia*. It has the following characteristics:

a. Genital arch broad below, angular, without a projecting process on the heel; a few short bristles below.

b. Anal plate not attached, with a moderate number of fine hairs, not noticeably denser at the lower tip.

c. Clasper quite small, scarcely projecting from under the genital arch; a small row of primary teeth, no secondary teeth or hairs.

In all respects except size, the genital characteristics of *D. coracina* fit those given above for the mirim species group, in which it is clearly not a member. This evidence points to the conclusion that this species may belong to a third species group which has as yet no other known members.

One further characteristic of the male genital structure should be mentioned. In all of the species observed (i.e., all but *D. coracina, nitens* and *mirim*) the entire male hypopygium, including the anal papilla, is sunken or recessed into the ventral portion of the abdomen, giving the adult fly the appearance of having a perfectly rounded abdomen, posteriorly. The extreme condition is present in *D. lebanonensis* in which the recession is so complete that, from a dorsal view, the tip of the abdomen seems to have been neatly severed with a sharp knife, leaving a straight edge.

The external female genitalia do not present any structural peculiarities which appear to be useful in a subgeneric diagnosis.

Internal morphology of imagines.

1. Malpighian tubes. Sturtevant has pointed out that in *D. victoria,* among others, the tips of the posterior tubes are closely apposed without the formation of a continuous lumen. With the exception of *D. coracina* and *nitens,* for which information is lacking, this condition is true for the other members of the subgenus. Being somewhat more specific, Dobzhansky and Pavan, in describing *D. mirim,* say: "Anterior Malpighian vessels much longer than posterior, both with common trunks about ½ of their total length, the tips of the anterior ones free, those of the posterior ones apposed without formation of continuous lumen." An examination of the other available species reveals that the anterior pair is much longer than the posterior in all the species, but the extent of a common trunk is scarcely more than 1/10 in *D. victoria* and *lebanonensis,* while it is about ½ for the anterior, ⅓ for the posterior pair in *D. baeomyia,* indicating another difference between the mirim and victoria species groups.

2. Testes. Sturtevant stated that the testis in *D. victoria* was oval, and gave the shape of this organ as elliptical in Pholadoris. The latter term seems to be preferable and is true for all of the species of the subgenus. The color of the testes seems to vary from one species to another, being a rusty tannish brown in *D. victoria,* dark reddish violet in *nitens* (translation), dark yellow in *lebanonensis,* deep amber yellow in *mirim,* and pale lemon yellow in *baeomyia.* Kikkawa and Peng did not give this character for *D. coracina.*

3. Ventral receptacle. Sturtevant stated that this organ "is a simple short tube or pocket in *corvina**," and described it as short, broad and curved in *D. victoria*. In *D. mirim* it is said to be "a finger-like rudiment, much shorter than the spermathecal ducts." This describes the condition in *D. baeomyia* quite well also. It is an equally short, insignificant-looking organ in *D. lebanonensis*. The situation in *D. coracina* and *nitens* is not known.

Other characteristics.

1. Eggs. The possession of more than four egg filaments is a unique character in the genus Drosophila and was cited by Sturtevant in his diagnosis of the subgenus Pholadoris, stating: "In Pholadoris there are from 6 to 9 filaments." All of the species listed in the previous section have six or more egg filaments although, as can be seen from Table 1, there is con-

TABLE 1

Range of number of filaments of eggs of species of Pholadoris, recorded as per cent of total laid by females in mass cultures. Figures for *D. nitens* calculated from Buzzati-Traverso (1943)

STRAIN	Number of egg filaments								
	2	3	4	5	6	7	8	9	10
victoria 1318A.7 Prescott, Ariz.	—	—	—	32	58	10	—	—	—
victoria 1720.5 Cliff, N. Mex.	—	—	—	16	55	26	3	—	—
victoria 1771.3 Casper, Wyo.	—	—	4	7	57	35	—	—	—
victoria 1873.2 Santa Rosa, N. Mex.	—	—	5	22	56	15	2	—	—
victoria 1870.8 Payson, Ariz.	—	—	—	12	34	47	7	—	—
victoria 1760.1 Poplar, Mont.	—	—	6	30	43	21	—	—	—
victoria 1853.3 Cave Creek, Ariz.	—	—	4	36	44	16	—	—	—
victoria 1854.2 Patagonia, Ariz.	—	—	—	25	42	28	5	—	—
victoria 1865.3 Veyo, Utah	—	—	1	25	52	21	1	—	—
nitens Italy	—	—	2	37	41	16	3	—	—
lebanonensis 1733.1 Beirut, Lebanon	—	—	—	—	5	44	44	5	1
baeomyia 1808.6 Oaxaca, Mex.	1	2	10	25	42	17	3	—	—
baeomyia 1877.6 Santee Riv., S. Car.	—	—	13	47	37	3	—	—	—
baeomyia 1795.8 Michoacan, Mex.	—	—	2	26	59	12	1	—	—
baeomyia 1813.7 Nuevo Leon, Mex.	—	1	15	62	19	3	—	—	—

*Probably referring to *D. victoria*, "corvina" being one of several manuscript names applied to this species before its description.

siderable variability in the actual number. The two extremes observed are 2 (about 1% in *D. baeomyia*) and 10 (about 1% in *D. lebanonensis*). In all species the filaments are relatively slender, pointed, and often tend to curl and split near their tips. They are generally a little shorter than the egg itself.

2. Larvae. The ability of the larvae to "skip" was mentioned by Sturtevant as characteristic of the subgenus although not confined to it. Larval skipping has been observed in *D. victoria, lebanonensis, nitens* and *baeomyia;* information is not available for *D. coracina* and *mirim.*

A larval character which has not been reported previously is the color. In the victoria species group the larvae are white, as is the usual situation in Drosophila. In *D. baeomyia,* however, the larvae exhibit a faint lavender coloration.

The minute hooklets present ventrally in eight bands are mentioned by Kikkawa and Peng as significant larval characters. They point out that these hooklets are quite blackish in some species (e.g., many of the Sophophora) but are colorless or but slightly tinged in a number of other species, including *D. coracina.* Buzzati-Traverso also describes this character for *D. nitens,* stating: "Hooklets of ventral surface of segments colorless" (translation). Our own observations show that these hooklets are extremely pale in both *D. victoria* and *lebanonensis* but that they are distinctly blackish in *D. baeomyia,* especially on the most posterior band.

A rather unusual larval character was observed by Wharton (1943) relative to the size of the salivary glands of *D. victoria.* She stated that: "The glands enlarge tremendously, occupying a large part of the body cavity of the larvae. One of the glands (seemingly always the left one) grows much larger than the other after the early stages of development and may be, roughly, as much as three times the size of the smaller gland in the late larval stages." A similar discrepancy in the size of these glands has been noted in *D. lebanonensis,* the left gland also being the larger. In *D. baeomyia,* however, the two glands are of approximately the same size.

3. Puparia. Sturtevant mentioned two characters of the puparia as characteristic of the subgenus: a very short anterior spiracular horn (1/10 or less the length of the puparium), and a low number of branches per anterior spiracle. Actually, in most of the species belonging to the subgenus the stalk (i.e., the horn) is so extremely short as to be considered missing, the branches usually appearing to be borne on the edges of the puparium. The number of branches varies from about 4 (in *D. coracina,* according to Kikkawa and Peng, and in *baeomyia*) to about 8 (in *D. nitens,* according to Buzzati-Traverso).

Kikkawa and Peng differentiated between posterior spiracles "closed" at the tip and divergent at the tip. In the first group they listed *D. coracina,* and in the second such species as *D. transversa, virilis, funebris,* etc. A careful check shows this to be a worth-while character, all the members of the subgenus having the tips of the posterior spiracles closed or tightly parallel. Concerning this character in *D. nitens* Buzzati-Traverso stated

that the "apices . . . are joined together," which undoubtedly means about the same thing.

The pupation pattern in laboratory vials is quite characteristic in those species which have been available. Most larvae dig into the cotton plug to pupate, although a certain number pupate on the side of the glass vial near the stopper. This tendency is less noticeable in *D. baeomyia.*

4. Chromosomes. Sturtevant, using a California stock, found the spermatogonial figures of *D. victoria* to consist of one large and one small pair of V's and two pairs of J's. Wharton (1943), using a different stock, described the metaphase configuration for this species as consisting of one pair of rods, two pairs of large V's and one pair of small V's.

Kikkawa and Peng give the metaphase configuration of *D. coracina* as being of the "A-type," which is two pairs of V's, one pair of rods, and one pair of dots. This determination has since been verified by Hsu (personal communication) using a stock from Meitan, China.

D. nitens is listed by Buzzati-Traverso as having "four pairs of V-shaped chromosomes. The largest pair shows a secondary constriction in consequence of which the chromosome is often bent in each arm, and similarly with the medium-sized pair. The other two pairs, which are of about equal size, do not present structural peculiarities. I was unable to distinguish the X from the Y" (translation).

The chromosomes of *D. lebanonensis,* as determined by C. Ward and T. C. Hsu of this laboratory, appear as three pairs of V's and one pair of rods in the larval brain cells.

Dobzhansky and Pavan give the metaphase plate of *D. mirim* as consisting of three pairs of V-shaped chromosomes and no dots.

D. baeomyia also possesses three pairs of V's and no rods nor dots, as determined by Ward and Hsu.

SUMMARY

On the basis of the various characters discussed in the preceding section the following revised diagnosis of the subgenus Pholadoris is presented.

Shining dark or yellowish species; egg filaments 4–10, usually 6–8; skipping larvae; anterior spiracle of puparium borne on extremely short stalk or none at all; branches of anterior spiracle 4–8; posterior spiracles tightly parallel or closed; pupation in or near cotton stoppers in laboratory vials; acrostichal hairs in 6 or 8 rows; prescutellars present; upper series of frontal hairs with their bases arranged in a rough V; arista with 7–8 branches, two below in addition to the terminal fork; second oral short, usually less than ½ fiirst; sterno-index high, 0.7–0.9; middle sternopleural usually well-developed; costal index usually below 2.0; 4th vein index 2.2–2.4; cheeks narrow, 1/6–1/10 greatest diameter of eyes; anterior Malpighian tubes much longer than posterior; posterior tubes apposed at their ends forming a ring around the gut but without a continuous lumen; testes elliptical; ventral receptacle short, finger-like; male genitalia with bristled genital arch, bristled anal plate which is not attached to the arch, and

clasper with a single row of primary teeth; male hypopygium recessed into abdomen.

The subgenus Pholadoris contains the following two species groups:

1. The victoria species group. Shining dark black or brown species; anterior scutellar bristles divergent; larvae white in color, ventral hooklets pale, left salivary gland enlarged; acrostichal hairs in 6 rows (except in *D. coracina* with 8); cheeks 1/6–1/7 width of eyes; posterior Malpighian tubes with common trunks scarcely more than 1/10 their total length; male genitalia with prominent horn-like process on heel of genital arch, the latter heavily bristled below; anal plate with especially dense bristles at lower tip, clasper extended outward beyond primary teeth and with numerous fine hairs (*D. coracina* exceptional in the case of all the genitalial characteristics).

This group contains *D. victoria* Sturtevant 1942, *D. coracina* Kikkawa and Peng 1938 (cf. below), *D. nitens* Buzzati-Traverso 1943, and *D. lebanonensis,* n. sp.

Two species described by Malloch (1934) from Samoa, *D. excepta* and *D. bryani,* may perhaps belong to this group. The following characters are in agreement with those listed above: arista with 8 long free hairs, three below (i.e., two below in addition to the fork); small, shining brown to brownish-black flies; prescutellars present; acrostichals in 6 irregular rows; "some minute hairs in front on sides and in centre"; anterior reclinate less than ½ as long as proclinate; vibrissa single and strong; cheeks "very narrow, almost linear"; third costal section with heavy bristles on the basal ⅔ (in *excepta*) or ¾ (in *bryani*); costal index about 1.5, when translated into modern terminology. The only character cited by Malloch which might argue against their inclusion in the group is his statement that there are but two sternopleurals, the middle one also being well-developed in the members of Pholadoris.

Drosophila anuda Curran (1936), described from the Santa Cruz group of islands in the Pacific, might also be listed tentatively as a member of the group. Characters agreeing with the above diagnosis are as follows: arista with four rays above and two below; cheeks very narrow; one pair of strong vibrissae; "three or four hairs on either side of the median vitta [of front] in an oblique row"; six rows of acrostichals; a pair of weak prescutellars; three sternopleurals; abdomen black, the apical segment shining; costal index 2.0 or less and 4th vein index more than 2.0 (when interpreted in the modern fashion). Other descriptive characters of this species agree quite well with those of *D. bryani,* mentioned earlier, for example: basal pair of scutellars about half as long as apical pair; anterior reclinate orbital situated slightly above the base of the proclinate. There is a distinct possibility that these two forms are the same.

2. The mirim species group. Semi-shining yellowish flies with black abdominal bands; anterior scutellars convergent; larvae a pale lavender color, ventral hooklets blackish, salivary glands about equal size; acrostichal hairs in 8 rows; cheeks 1/8–1/10 width of eyes; posterior Malpighian tubes with common trunks ½–⅓ their total length; male genitalia

lacking horn-like process on heel of genital arch, the latter being but lightly bristled; anal plate without dense bristles at lower tip; clasper small, scarcely projecting beyond genital arch, with fine hairs.

This group contains *D. mirim* Dobzhansky and Pavan 1943 and *D. baeomyia*, n. sp.

In view of the several prominent discrepancies in the characteristics of *D. coracina* when compared with the other members of the victoria group (e.g., 8 acrostichal rows, male genitalia as in the mirim group) and the lack of information on several important group differentiating characters (e.g., color of larvae, anterior scutellars, common trunk of Malpighian tubes) it seems possible that this species is incorrectly placed in the victoria species group and may represent still another species group within the subgenus, but the writer does not feel that it is safe to erect such a group until further information becomes available.

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