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GENERA OF THE DIPTEROUS TRIBE SARCOPHAGINI.

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The *Sarcophaga* type is most nearly related on the one hand with the Muscidae (Calliphoridae) and on the other hand with the *Miltogramma* and *Metopia* types. Through the Muscidae it is next related with the Stomoxydidae (Muscinae auct.) and through the *Miltogramma* type with the Calirrhoidae (Dexiinae auct.) and the Dexiidae (Pseudodexiidae BB). *Brachicoma*, *Amobia* and *Tephromyia* are types of tribes which belong in the family with *Sarcophaga*, and it is probably taxonomically expedient to include the *Miltogramma* and *Metopia* types in the same family.

Sarcophaga has long functioned as a catch-all generic name. As such, it means little. A genus can not be conceded by elimination, but must be recognized by definition. *Sarcophaga* has thus grown to be a taxonomic complex which demands untangling. The genitalic method of distinguishing the species has worked well in Europe, where the forms have been under observation long enough to link both sexes in most cases. In attacking the mass of comparatively unknown species in America, however, the task of separating them is better begun at the female end. Gravid females, captured in the open, will furnish larvae for the study of the three stages and rearing to the adults of both sexes. At one stroke this plan yields characters of all stages and both sexes. Study of the total characters for the species shows natural groups of species in this tangled mass of unlike forms.

The real problem which confronts us in the *Sarcophaga* complex is the elucidation of species groups or genera. It is first

all-important to know what species belong together. When these groups are properly segregated, the species can be studied to advantage. The elucidation of the genera carries with it a knowledge of both sexes of the component species, which is the necessary antecedent to the male genitalic separation of the forms. In the light of such study it is found that the complex has lodged many forms which can not be admitted to the tribe Sarcophagini.

GENERA OF SARCOPHAGINI.

MALES.

Abdomen absolutely devoid of pollinose covering, polished and shining	<i>Peckia</i> RD.	
Abdomen always with more or less pollinose covering, not wholly shining		2
2—One pair of proclinate fronto-orbitals		3
No proclinate fronto-orbitals		4
3—Parafacialia with at most a single row of fine hairs	<i>Sarcophagula</i> Wp.	
Parafacialia with two or more irregular rows of fine hairs	<i>Sarothromyia</i> BB.	
4—All tibiae long-villous		5
None of tibiae long-villous		6
At least the hind tibiae long-villous, either thickly or thinly, but the front ones not		25
5—First vein bare	<i>Paraphrissopoda</i> T.	
First vein bristled about half way	<i>Tulaeopoda</i> , gen. nov.	
6—First vein bristled about half way		7
First vein bare		12
7—Frontals not divergent, stopping practically at base of antennae		8
Frontals diverging at least one bristle below base of antennae		10
8—No median marginal macrochaetae on segment III	<i>Andinoravinia</i> , gen. nov.	
Median marginals present on segment III		9
9—Parafacialia as broad as clypeus	<i>Argoravinia</i> , gen. nov.	
Parafacialia not as broad as clypeus	<i>Chaetoravinia</i> , gen. nov.	
10—Strong, long, erect median marginals on segment II (patch of thickly-placed hairs on edge of scutellum on each side in genotype)	<i>Titanogrypa</i> T.	
No median marginals on segment II		11
11—Outer vertical developed	<i>Sarcodexiopsis</i> , gen. nov.	
Outer vertical not sufficiently developed to contrast with occipito-orbital fringe	<i>Helicobia</i> Coq.	
12—Frontals stopping practically at base of antennae, not divergent except as they follow frontalia		13
Frontals diverging at least one bristle below base of antennae		17

- 13—Frontalia much narrowed posteriorly *Agria* RD.
 Frontalia not or but very slightly narrowed posteriorly 14
- 14—Vertex as wide as eye *Miltoravinia*, gen. nov.
 Vertex at most scarcely over two-thirds as wide as eye 15
- 15—Postsuturals three *Ravinia* RD.
 Postsuturals four 16
- 16—Median marginals absent or vestigial on segment III
Punasarcophaga T.
 Median marginals present on segment III *Euravinia*, gen. nov.
- 17—Postsuturals three 18
 Postsuturals four, the front two more or less reduced 19
- 18—Fifth sternite swollen and projected in profile like a button
Hypopelta Ald.
 Fifth sternite normal *Fletcherimyia*, gen. nov.
- 19—Outer verticals well developed; forceps minute (hind femora
 and tibiae normally specialized for grasping the female in
 the genotype) *Thelylepticocnema* T.
 Outer verticals not well differentiated from occipito-orbital
 fringe 20
- 20—Preatrostichals well developed, strong *Kellymyia*, gen. nov.
 Preatrostichals not well developed, at most very small or
 vestigial 21
- 21—Frontalia not narrowed posteriorly 22
 Frontalia more or less narrowed posteriorly 23
- 22—Strong median marginals on segment III *Peltopyga*, gen. nov.
 No median marginals on segment III *Spirobolomyia* T.
- 23—Cheeks over two-fifths of eye-length *Trixosarcophaga*, gen. nov.
 Cheeks not over one-fourth of eye-length 24
- 24—Hypopygium small; forceps elongate and tapering *Sarcodexia* T.
 Hypopygium rather large; forceps shortened and broadened
 apically, usually with a dorsal preapical spur
Oxysarcodexia, gen. nov.
- 25—Preatrostichals present, well developed 26
 Preatrostichals not well developed, at most very weak, small
 or vestigial 30
- 26—Frontals not divergent, stopping close to base of antennae .
Sarothromyiops, gen. nov.
 Frontals diverging at least one bristle below base of antennae 27
- 27—Hypopygium wide, flattened, boxlike, the second segment
 very elongate; forceps very short *Zygastropyga*, gen. nov.
 Hypopygium not flattened and boxlike, the second segment
 not unusually long 28
- 28—Strong erect median marginals on segment II *Mulsantia* RD.
 No median marginals on segment II 29
- 29—Facio-orbital row including 3 to 5 strong bristles below; ver-
 tex about one-half eye; cheeks about one-third eye-length,
 parafacialia about one-half width of clypeus; long strong
 macrochaetae in median longitudinal row on outside of
 hind femora *Boettcheria* Pkr.

- Facio-orbital row consisting of a bristle or two without hairs above; vertex but little over one-fourth eye-width; cheeks about one-fourth eye-length; parafacialia not one-third width of clypeus; at most a few median macrochaetae distally on hind femora exteriorly **Parasarcodexia**, gen. nov.
- 30—Postsuturals three 31
 Postsuturals two, with or without two more or less developed additional ones in front 33
- 31—Strong median marginals on segment II (the front side of middle femora with a patch of yellow hairs distally in the genotype) *Sarcotachinella* T.
 No median marginals on segment II 32
- 32—Outer verticals developed, strong *Bellieria* RD.
 Outer verticals not developed **Bercaeopsis**, gen. nov.
- 33—Parafacialia broader than clypeus; no facio-orbital row to be distinguished from the other hairs *Wohlfahrtiopsis* T.
 Parafacialia not as wide as clypeus 34
- 34—Facio-orbital row including several strong bristles below 35
 Facio-orbital row consisting only of hairs at the most 36
- 35—Vibrissal axis nearly equalling head-height; epistoma well projected beyond vibrissae; facialia bristled about half-way at most; cheeks over one-half eye-length *Sarcophaga* Mg.
 Vibrissal axis not over three-fourths of head-height; epistoma only slightly projected; facialia normally bristled well over half-way; cheeks little over two-fifths eye-length
Sarraceniomyia, gen. nov.
- 36—Vertex about two-thirds as wide as eye *Bercaea* RD.
 Vertex at most but little exceeding one-half eye-width 37
- 37—Outer vertical strong **Prosthetocirca**, gen. nov.
 Outer vertical not developed, vestigial **Gigantotheca**, gen. nov.

FEMALES.

- Abdomen wholly shining and without pollen *Peckia* RD.
 Abdomen more or less pollinose 2
- 2—Only one pair of proclinate fronto-orbitals 3
 Two or more pairs of proclinate fronto-orbitals 4
- 3—First hypopygial tergite retractile *Sarcophagula* Wp.
 First hypopygial tergite modified into a non-retractile permanent fifth visible segment of the abdomen **Prosthetocirca**, gen. nov.
- 4—No reclinate fronto-orbitals, usually three proclimates *Agria* RD.
 At least one reclinate fronto-orbital always present, proclimates two 5
- 5—First vein bristled about half way 6
 First vein bare 12
- 6—Strong, long and erect median marginals on segment II (sides of scutellum with thick patches of hairs on edge between lateral bristles in genotype) *Titanogrypa* T.
 Median marginals absent, vestigial or weak on segment II 7

7—Frontals not divergent, stopping practically at base of antennae	8
Frontals diverging at least one bristle below base of antennae	10
8—First hypopygial tergite incised on median line posteriorly, the hind edge of segment forming a wide vertical slit bordered with partly decussate bristles; parafacialia rather broader than clypeus	Argoravinia , gen. nov.
First hypopygial tergite entire, not forming a vertical slit, parafacialia not as broad as clypeus	9
9—Vibrissal axis not over two-thirds of head-height	Chaetoravinia , gen. nov.
Vibrissal axis fully three-fourths of head-height	Andinoravinia , gen. nov.
10—Vibrissal axis only a little shorter than head-height	Tulaeopoda , gen. nov.
Vibrissal axis about or but little over two-thirds of head-height	11
11—Two reclinate fronto-orbitals	<i>Helicobia</i> Coq.
Only one reclinate fronto-orbital	Sarcodexiopsis , gen. nov.
12—Postsuturals three	13
Postsuturals two or four	20
13—Frontals not divergent, stopping practically at base of antennae	14
Frontals diverging at least one or two bristles below base of antennae	15
14—Costal spine strong	<i>Sarothromyia</i> BB.
Costal spine absent	<i>Ravinia</i> RD.
15—First hypopygial tergite excised or scooped out on disk . . .	16
First hypopygial tergite not excised or scooped out on disk .	17
16—Strong median marginals on segment II (yellow hair patch on outside of middle femora distally in genotype) <i>Sarcotachinella</i> T.	
No median marginals on segment II	<i>Bellieria</i> RD.
17—Two reclinate fronto-orbitals; costal spine strong, longer than small crossvein	<i>Hypopelta</i> Ald.
Only one reclinate fronto-orbital; costal spine weak, short or vestigial, not as long as small crossvein	18
18—First hypopygial tergite incised on median line posteriorly, the hind edge of segment forming a vertical slit bordered with partly decussate bristles	Bercaeopsis , gen. nov.
First hypopygial tergite entire	19
19—Facio-orbitals consisting of row of fine hairs; lateral scutellars two; median longitudinal row of macrochaetae on outside of hind femora reduced to small bristles on basal half	Fletcherimyia , gen. nov.
Facio-orbital row including several strong bristles below; lateral scutellars three; normally a median longitudinal row of long strong macrochaetae on outside of hind femora for most of its length	<i>Boettcheria</i> Park.
20—Preacrostichals present, well developed	21
Preacrostichals absent or vestigial, not well developed . . .	24

21—Frontals not diverging, stopping practically at base of antennae	22
Frontals diverging at least one bristle below base of antennae	23
22—Cheeks well over one-half eye-length in breadth	
Miltoravinia , gen. nov.	
Cheeks less than one-half eye-length in breadth	
Euravinia , gen. nov.	
23—First hypopygial tergite entire, the disk with a double impression as though scooped out on each side of median line in a subtransverse oval	Kellymyia , gen. nov.
First hypopygial tergite incised on median line posteriorly, without discal excavation or impression	Zygaetropyga , gen. nov.
24—First hypopygial tergite entire, neither incised nor excised	25
First hypopygial tergite either incised or excised	30
25—Facio-orbital row including coarse strong hairs or weak bristles below, contrasted with the hairs in line above them	
<i>Spirobolomyia</i> T.	
Facio-orbital row consisting entirely of short or weak hairs, or vestigial	26
26—First hypopygial tergite transversely dished like a wide shallow groove	27
First hypopygial tergite not dished	28
27—Theca immensely broad as well as elongate, nearly as broad basally as long; palpi greatly swollen apically	
Gigantotheca , gen. nov.	
Theca not unusually broad; palpi normal	Umbelusía , gen. nov.
28—Strong median marginals on segment III; first hypopygial tergite shield-like, broad, with disk directed posteriorly	
Peltopyga , gen. nov.	
Median marginals absent or vestigial on segment III	29
29—Parafacialia about or nearly as wide as clypeus; first hypopygial tergite strongly crescentic in outline, not flattened	
Trioxsarcophaga , gen. nov.	
Parafacialia only a little over half as wide as clypeus; first hypopygial tergite more or less flattened and concealed	
Oxysarcodexia , gen. nov.	
30—Parafacialia broader than clypeus	<i>Wohlfahrtiopsis</i> T.
Parafacialia not as wide as clypeus	31
31—Arista long-plumose nearly or practically to tip; or, if sometimes short of tip, the eyes large and cheeks scarcely exceeding at most one-fourth eye-length in breadth	32
Arista plumose not over three-fourths way, the cheeks fully or over one-third eye-length	33
32—Frontalia broader than parafrontalia in middle; cheeks nearly one-half eye-length in width; first hypopygial tergite showing posteriorly a vertical slit bordered with partly decussate spines, its disk broadly scooped out .	<i>Paraphrissopoda</i> T.
Frontalia scarcely as wide as parafrontalia in middle; cheeks about one-fourth eye-length; first hypopygial tergite folded but not slit on median line	<i>Sarcodexia</i> T.

- 33—Facio-orbital row consisting only of hairs *Bercaea* RD.
 Facio-orbital row including three to five strong bristles below 34
- 34—Vibrissal axis nearly equal to head-height; epistoma well projected beyond vibrissae; cheeks over one-half eye-length; parafacialia only a little narrower than clypeus . *Sarcophaga* Mg.
 Vibrissal axis not over three-fourths of head-height; epistoma but little projected; cheeks only about one-third of eye-length; parafacialia at most little over half width of clypeus
- Sarraceniomyia**, gen. nov.

GENOTYPES OF THE NEW GENERA.

- Andinoravinia**, *A. rufipes*, n. sp.
Argoravinia, *Sarcophaga argentea* T., Proc. U. S. N. M., vol. 43, 358 (1912).
Bercaeopsis, *Sarcophaga tetra* Ald., Sarc. & Allies, 89 (1916).
Chaetoravinia, *Helicobia quadrisetosa* Coq., Ent. News, XII, 17 (1901).
Euravinia, *Ravinia communis* Park., Proc. Bost. Soc. N. H., vol. 35, 55 (1914).
Fletcherimyia, *Sarcophaga fletcheri* Ald., Sarc. & Allies, 96 (1916).
Gigantotheca, *G. galapagensis*, n. sp.
Kellymyia, *Sarcophaga kellyi* Ald., Jn. Ag. Res., II, 443.
Miltoravinia, *Sarcophaga planifrons* Ald., Sarc. & Allies, 249 (1916).
Oxysarcodexia, *Sarcophaga peltata* Ald., Sarc. & Allies, 216 (1916).
Parasarcodexia, *Sarcophaga parkeri* Ald., Sarc. & Allies, 78 (1916).
Peltopyga, *Sarcophaga celarata* Ald., Sarc. & Allies, 242 (1916).
Prosthetocirca, *P. cana*, n. sp.
Sarcodexiopsis, *Sarcophaga biseriata* Ald., Sarc. & Allies, 153 (1916).
Sarthromyiops, *S. cinctus*, n. sp.
Sarraceniomyia, *Sarcophaga sarraceniae* Riley, Tr. Ac. Sc. St. L., III, 238.
Trixosarcophaga, *Sarcophaga aurigena* T., Proc. U. S. N. M., vol. 43, 357-8 (1912).
Tulaeopoda, *Sarcophaga pervillosa* Ald., Sarc. & Allies, 92 (1916).
Umbelusia, *U. analis*, n. sp.
Zygastropyga, *Z. aurea*, n. sp.

DESCRIPTIONS OF THE NEW SPECIES.

Zygastropyga aurea, new species.

Length of body, 8 to 9 mm.; of wing, 6.75 to 7 mm. One male and one female. Tempe, Arizona; Webster, No. 11,942 (V. L. Wildermuth). The female bears label "Allotype No. 20,550 U. S. N. M.," referred to by Aldrich as single female of *S. sulculata* Ald. from Kansas (Sarc. & Allies, 225). Holotype, No. 21,574 U. S. N. M., male.

Differs from *sulculata* Ald. by the broader abdomen; broader male hypopygium, the deeper median fossa of second hypopygial segment; the distinctly golden pollen of head, and the brassy shade to pollen of rest of body.

Andinoravinia rufipes, new species.

Length of body, 8 to 9 mm.; of wing, 7.5 to 8 mm. One female, Huariaca, canyon of the Rio Huallaga, Peru, 10,750 ft., December 20, 1913 (Townsend). One male and one female, Matucana, Peru, 8,000 ft., May 1, 1914 (Townsend). Holotype, No. 21,575 U. S. N. M., being the female from Huariaca.

Blackish; rather densely clothed with old-gold pollen, except the tarsi, head appendages, frontalia and abdominal marmoration. Legs rufous, except the black tarsi. Frontalia black, parafrontals blackish posteriorly. Antennae blackish, first two joints rufous. Palpi rufous-yellow. Thoracic vittae brown, changing to brownish-gold when their pollinose covering is viewed from the front. Marmorate markings of abdomen black, in form of broken narrow median vitta and oblique curved marks on each side. Hypopygium rufous. Tegulae whitish-tawny, faintly yellowish infusate. In the male the median abdominal vitta is entire.

Prosthetocirca cana, new species.

Length of body, 5 to 8.5 mm.; of wing, 4 to 7 mm. One male and one female, Narborough Is., Galapagos, January 13 and 26, 1899; two males and two females, Albemarle Is., Galapagos, January 1 to 18, 1899. Holotype, No. 21,576 U. S. N. M., female from Narborough Is. Allotype, male from Albemarle Is.

Blackish, densely ash-silvery pollinose. Frontalia and thoracic vittae black to brown. Antennae blackish. Palpi rufous, shaded with black. Hind edge of abdominal segments black, rather shining; in the male the black shows a median vitta, and a linking of the lateral markings on last two segments. Hypopygium black. Tegulae rather infusate, the front scale whitish.

Gigantotheca galapagensis, new species.

Length of body, 6.5 to 9.5 mm.; of wing, 5.5 to 8.5 mm. Two males and two females, Albemarle Is., Galapagos, January 18, 1899. Holotype, No. 21,577 U. S. N. M.; female.

Coloring very similar in general effect to the preceding species, differing as follows: Palpi black, the extreme base rufous. Hypopygium rufous. Tegulae white. The lateral abdominal markings are more distinctly linked up into lateral vittae of irregular outline, the curved links especially definite in male.

Sarothromyiops cinctus, new species.

Length of body, 10 mm.; of wing, 8.5 mm. One male, Culpepper Is., Galapagos, December 10, 1898. Holotype, No. 21,578 U. S. N. M.

Black; densely silvery pollinose, the pollen with less of an ashy shade. Palpi faintly rufous. Antennae and frontalia blackish. Thoracic vittae black to brown. Hind margins of abdominal segments and narrow

median vitta black, brown pollinose. Hypopygium black, silvery pollinose, tawny at base of forceps and in middle of hind margin of first segment. No linking of marginal black into lateral abdominal vitta, but a faint darker shade shows laterally under the thick silvery pollen. Tegulae white.

I can identify none of the above Galapagos forms with *Sarcophaga inoa* Walker, List IV, 832.

Umbelusia analis, new species.

Length of body, 10.5 mm.; of wing, 9 mm. One female, Umbelusi, East Africa, "5. 3. 09" (C. W. Howard). Holotype. No. 21,579 U. S. N. M.

Black, including antennae, palpi, frontalia, vittae, abdominal markings, and legs. Hypopygium reddish-yellow. Pollen silvery-ashy. Besides the abdominal marmorations, deep black shows in narrow median vitta and in heavy broken lateral vittae. Parafrontals blackish posteriorly. Parafacials transversely corrugated. Tegulae white.



