A CONTRIBUTION TO THE KNOWLEDGE OF THE GENUS *BOETTCHERISCA* ROHDENDORF, 1937 (*Diptera, Sarcophagidae*) *

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(With 56 text-figures)

The genus *Boettcherisca* was created by ROHDENDORF for *Myophora peregrina* Desvoidy. The same author includes in the genus *B. septentrionalis* Rohdendorf, 1937, placed in the subgenus *Notochaetomima* Rohdendorf on account of shape of the ventralia and the chitinized apical plate of the *paraphallus*. *Boettcherisca formosensis* Kirner & Lopes presents characters of both subgenera and I do not, therefore, consider the subgenus *Notochaetomima* in this paper.

Boettcherisca peregrina (Desvoidy) is a very widely distributed species, occurring in Japan, Manchuria, China, India, Ceylon, Volcano Is., Bonin Is., Mariana Is. (Agriham) and Hawaii in the Northern Hemisphere. In the Southern Hemisphere the species was found in Australia, New Guinea, New Britain, Fiji and Samoa. Near the Equator it is recorded from Gilbert Is. Between its northern and southern areas *B. peregrina* is substituted by *B. karni* (Hardy) in Cocos Is., Java, Borneo, Palau, Caroline Is., Mariana Is. and Marshall Is. This distribution has been established from published data and material studied by the author. The morphological differences between *B. peregrina* and *B. karnyi* are few but seem to be constant. There are certainly two different taxa which I consider, at present, as distinct species. I found, however, both species to be present in the Island of Agriham (Mariana Is.). I believe information is relatively scarce and more intensive collecting is necessary to arrive at a definite conclusion. It is very important to solve the question to carry out an accurate study of *Boettcherisca* from the Island of Agriham, including rearing and crossing experiments involving the two species.

Five more species belonging to the genus occur in the same region: *B. septentrionalis* Rohdendorf (Manchuria and Japan), *B. formosensis* Kirner & Lopes (Formosa), *B. nathani* sp. n. (India), *B. javanica*

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sp. n. (Java) and *atypica* (Baranov) (Solomon Is.). The above species present much more specific differences in the male genitalia, than the differences observed between *B. peregrina* (Desvoidy) and *B. karnyi* (Hardy).

Boettcherisca Rohdendorf, 1937

Boettcherisca Rohdendorf, 1937: 51, 60, 270, 271, 396, 458, 459
Athyrsiola Baranov, 1938: 174
Boettcherisca Lopes, 1958: 28
Boettcherisca Lopes, 1959: 42

Propleura hairy on the center. Four or more postsutural dorsocentral bristles, only two posterior strong ones. R_1 bare. First genital segment of the male without marginal series of bristles. *Phallotheca* well constituted. *Ventralia* of penis well developed, bilobed, bearing numerous spines. The lateral plates of the *paraphallus* are elongated plates with two sharp points on the extremity. Glans short and robust, not surpassing the apical plate of *paraphallus*. First genital tergite of females entire or interrupted at the middle, always with parallel posterior margins. Tergite 8 represented by a strong chitinized trapezoidal plate. Sternite 8 strongly concave on posterior margin with long bristles on lateral posterior side.

Type species: *Myophora peregrina* Desvoidy, 1830.

I consider *Athyrsiola* Baranov (typus: *A. atypica* Baranov) a synonym of *Boettcherisca* Rohdendorf.

Key to the species of "Boettcherisca" Rohdendorf
(*B. atypica* Baranov not included)

1. Anterior margin of *ventralia* almost straight 2
— Anterior margin of *ventralia* rounded 3
2. Apical plate of *paraphallus* strongly chitinized, with basal lobe slender and elongate ..... *B. septentrionalis* Rohd.
— Apical plate of *paraphallus* almost membranous with wide basal lobe ..... *B. formosensis* Kirner & Lopes
3. Numerous spines on the apex of the *forcipes superiores* extending to the dorsal side 4
— Spines of the apex of *forcipes superiores* not extending to the dorsal side 5
4. *Ventralia reduced* (fig. 45), glans not incised on the apex ..... *B. javanica* sp. n.
— Ventralia large (fig. 51), glans with apical incision ..... *B. nathani* sp. n.
5. *Palpi genitalium* with apical flap (fig. 40) .... *B. karnyi* (Hardy)
— *Palpi genitalium* pointed at the apex. ..... *B. peregrina* (Desv.) (= *S. fuscicauda* Boettcher, = *S. hutsoni* Parker)

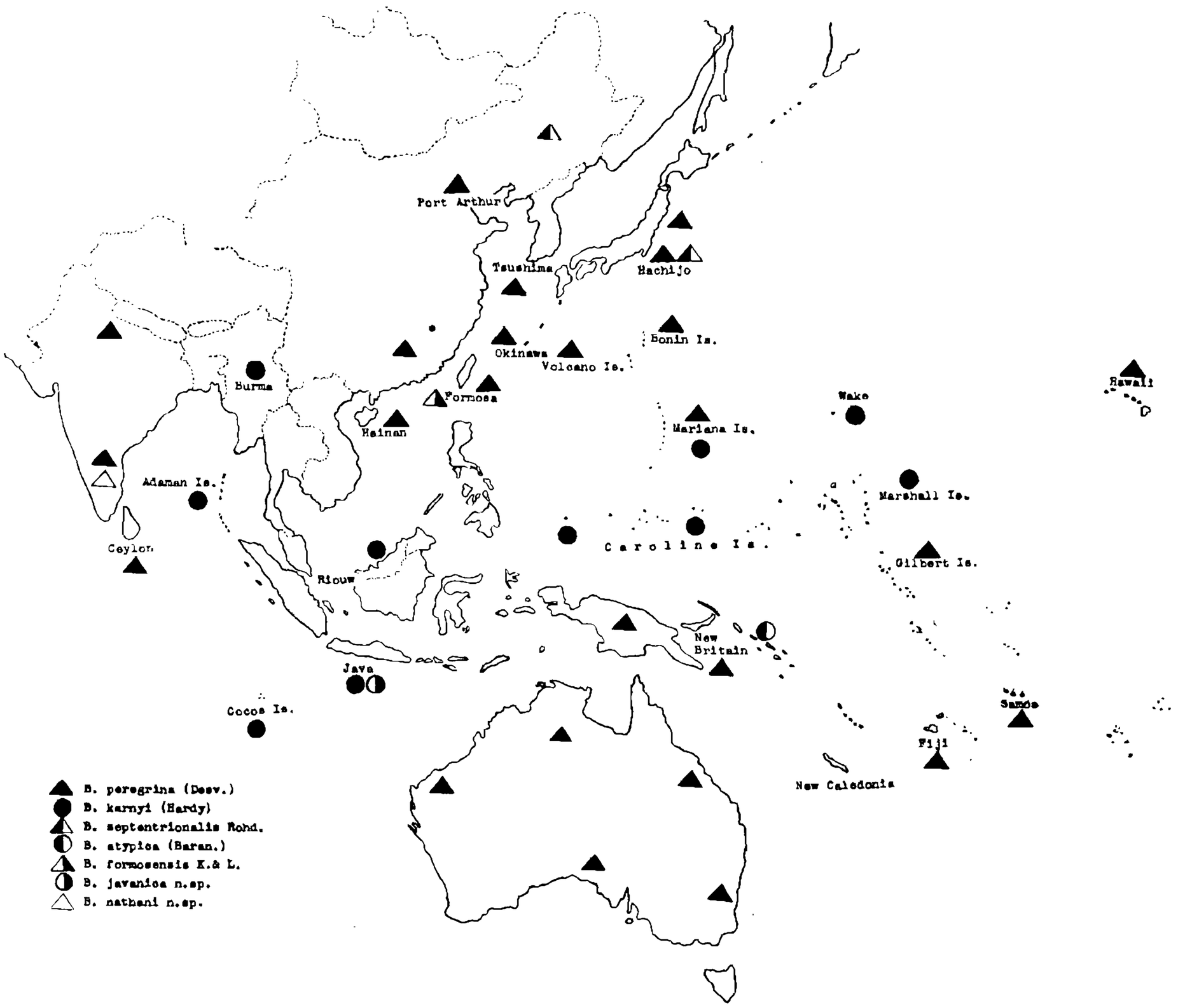


Fig. 1 — Geographical distribution of the species of *Boettcherisca*.

Boettcherisca peregrina (Desvoidy, 1830) (Figs. 2-36)

Myophora peregrina Desvoidy, 1830: 356 (Port Jackson, Sydney)
? Sarcophaga tritonia Macquart, 1851: 234 (New Guinea)
? Sarcophaga ochripalpis Thomson, 1868: 537 (Sydney)
Sarcophaga fuscicauda Boettcher, 1912: 169, fig. 3 (Formosa)
? Sarcophaga fuscicauda Boettcher, 1913: 379 (Singapura)
Sarcophaga fuscicauda Eysell, 1915: 3 (China, male, female, larva III, human myiasis)
Sarcophaga sp. Timberlake, 1918: 371 (Hawaii)
Sarcophaga frontalis Johnston & Bancroft, 1920: 23, *nec* Thomson, 1868 (parasitized by *Spalangia muscidarum* Richardson, Australia)
Sarcophaga irrequieta Johnston & Tiegs, 1921: 63, figs. 1-3, *nec* Walker, 1849 (Brisbane)
Sarcophaga peregrina Johnston & Tiegs, 1922: 177 (Sydney, New Guinea)
Sarcophaga peregrina Johnston & Tiegs, 1922: 87 (Brisbane, life cycle)
Sarcophaga peregrina Johnston & Tiegs, 1922: 182 (Brisbane, Sydney, N. S. Wales, W. Australia, bred from *Euploea corina* and *Chortoicetes termifera*, = *fuscicauda* Boettcher)
Sarcophaga peregrina Johnston & Hardy, 1923: 121, fig. 22 (Queensland, N. S. Wales, S. Australia)

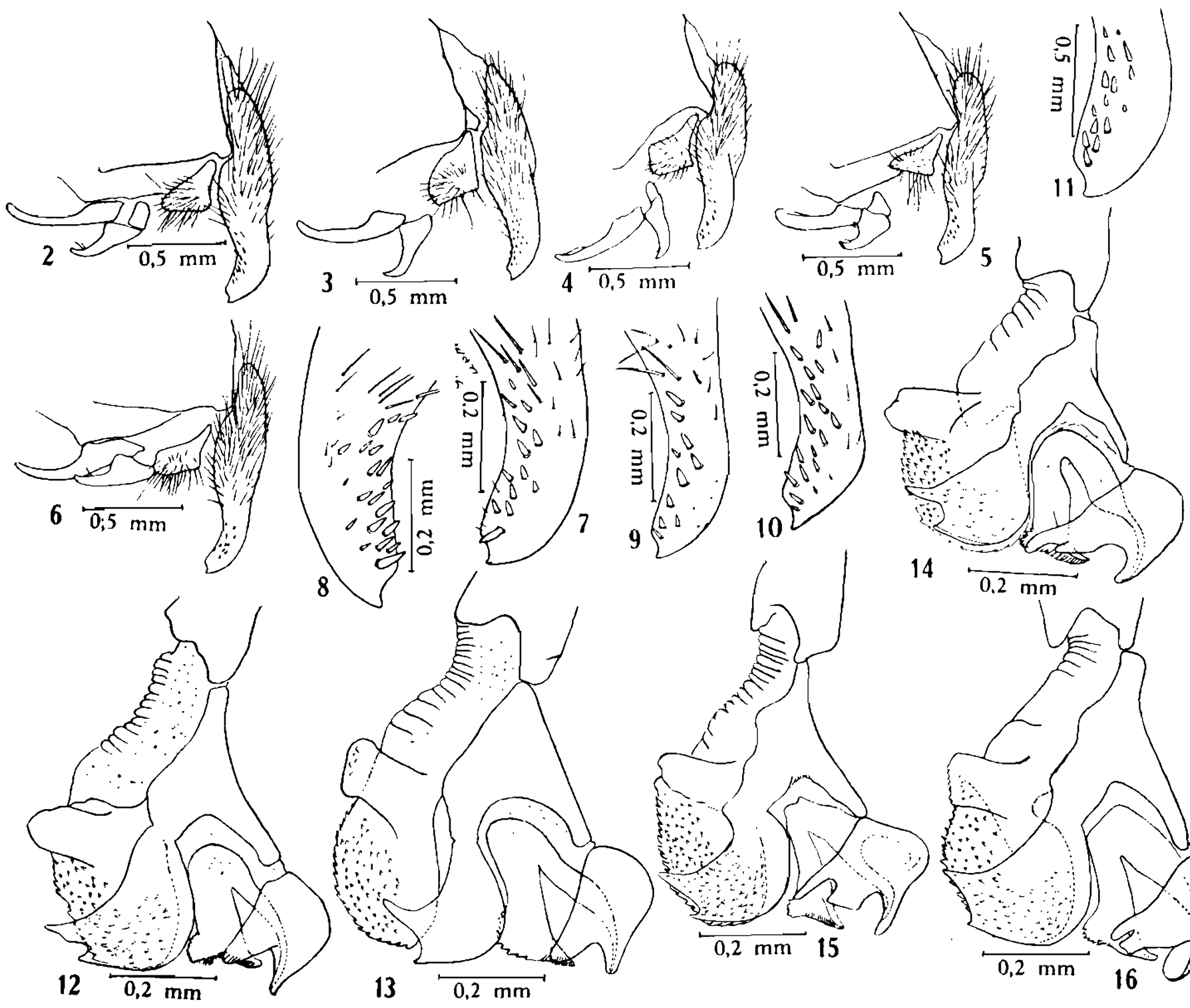
Sarcophaga hutsoni Parker, 1923: 127, fig. 4 (S. India, Ceylon, bred from grasshoper, taken from *Aristolochia* sp.)
Sarcophaga fuscicauda S. White, 1924: 252, pl. 12, fig. 20 (India, Ceylon, Hawaii, Australia, = *hutsoni* Parker, bred from dead insects, molluscs and mammals, external myiasis)
Sarcophaga fuscicauda Greene, 1925: 11, fig. 12 (Hawaii, puparium)
Sarcophaga fuscicauda Illingworth, 1926: 262 (Queensland north of Brisbane, S. Japan, China, Hawaii; dead insects, human excrement, hen manure; distinct frcm *irrequieta* Walker)
Sarcophaga fuscicauda S. White, 1927: 77 (India, from dead *Achatina*)
Sarcophaga fuscicauda Bezzi, 1928: 6, 189, 191 (Fiji, onions from Australia)
Sarcophaga fuscicauda Patton & Evans, 1929: 484, figs. (China, larva III, human myiasis)
Sarcophaga fuscicauda Buxton, 1929: 145, figs. 2B, 3B, 4B, 6B (Samoa, larva III)
Sarcophaga fuscicauda S. White, 1930: 74 (India)
Sarcophaga peregrina Hardy, 1932: 45 (Australia)
Sarcophaga fuscicauda Bryan, 1934: 417 (Hawaii)
Sarcophaga fuscicauda Ho, 1934: 31 (Chekiang, Kiangsu, China)
Sarcophaga fuscicauda Ho, 1936: 212 (Hainan)
Boettcherisca peregrina Rohdendorf, 1937: 270, 271, 458, 459, figs. 374, 375, 387, 388 (Port Arthur)
Sarcophaga peregrina Lopes, 1938: 561, pl. 3, figs. 2-5 (Australia)
Sarcophaga fuscicauda S. White, Aubertin & Smart, 1940: 272, fig. 147, partim (India, Ceylon, Tsushima Is. (S. of Corea), Riouw Arch. (SE of Malaya), dead Oligochaeta, insects, molluscs and mammals; myiasis)
Sarcophaga fuscicauda Ho, 1940: 119, partim (Riouw Arch., Java, China)
Sarcophaga peregrina Lopes, 1941: 55 (Hawaii)
Sarcophaga peregrina Seguy, 1941: 131, figs. 171-175 (China)
Sarcophaga fuscicauda Henning, 1941: 185, partim (Formosa, Singapura)
Sarcophaga peregrina James, 1947: 55, partim (refers Malaya and Perak)
Sarcophaga peregrina Kano, 1950: 854 (Hakkaido, Japan)
Sarcophaga peregrina Kano, Sato & Tange, 1951: 115, figs. 1-7 (Hongsu and Hokkaido, Japan, larvae I to III)
Sarcophaga peregrina Hori, 1951: 3, fig. 2 (Japan)
Sarcophaga peregrina Kano, 1951: 15 (Hachigo Is., Japan)
Sarcophaga peregrina Quo, 1952: 76, 80, 82, 83 (Shangai)
Sarcophaga peregrina Hardy, 1952: 407 (Hawaii)
Sarcophaga peregrina Hardy, 1952: 478 (Hawaii)
Sarcophaga peregrina Kano, 1957: 291, fig. 9 (Okinawa, Japan)
Boettcherisca peregrina Lopes, 1958: 29, fig. (Volcano Is., Bonin Is., Mariana Is.)

Male: Length 7 to 12 mm. Head yellowish, silvery pollinose. Front 0,19 to 0,25 of width of head. Frontalia black or reddish black. Ocellar bristles small; outer vertical bristle not developed. Parafacialia with a series of hairs near the eyes. Parafrontalia with small irregular hairs. There are 10 to 13 frontal bristles, two or three bristles diverging and below base of antennae. First and second antennal segments blackish, third sometimes gray with reddish base, second segment about 0,42 as long as third, the latter reaching 0,8 of distance to vibrissae which are just above oral margin. Facialia with hairs on lower third, sometimes a little more extensive. Arista plumose on basal two-thirds. Back of

head with one or two rows of black bristles as well as postocular cilia; remaining hairs white. Genae with black hairs only.

Thorax gray. Three supraalar postsutural bristles and two presuturals; five to seven postsutural dorsocentral bristles, only two posterior ones well developed and four to five presuturals; acrostichal bristles little differentiated, prescutellar strong; scutellum with two pairs of strong marginal bristles, apical and preapical pairs well developed. Three sternopleural bristles at the same level. Hypopleural bristles eight to ten. Propleura with small hairs in center sometimes few in number or rarely absent.

Abdomen gray, a pair of median marginal bristles on fourth tergite. Sternites I and II with dense hairs, sternites III and IV with short, sparse hairs; V red, with black spines beyond the fork. Genital segments reddish black, the first with grey pollen and small irregular hairs beside a posterior series of long hairs; the second shining, with



Boettcherisca peregrina (Desvoidy), male — Fig. 2: Genitalia (nr. 8.516, Formosa); fig. 3: idem (nr. 8.521, Australia); fig. 4: idem (nr. 8.522, Hawaii); fig. 5: idem (nr. 8.523, India); fig. 6: idem (nr. 8.519, Japan); fig. 7: apex of *forcipes superiores* (nr. 8.516, Formosa); fig. 8: idem (nr. 8.521, Australia); fig. 9: idem (nr. 8.522, Hawaii); fig. 10: idem (nr. 8.523, India); fig. 11: idem (nr. 8.519, Japan); fig. 12: penis (nr. 8.516, Formosa); fig. 13: idem (nr. 8.521, Australia); fig. 14: idem (nr. 8.522, Hawaii); fig. 15: idem (nr. 8.523, India); fig. 16: idem (nr. 8.519, Japan).

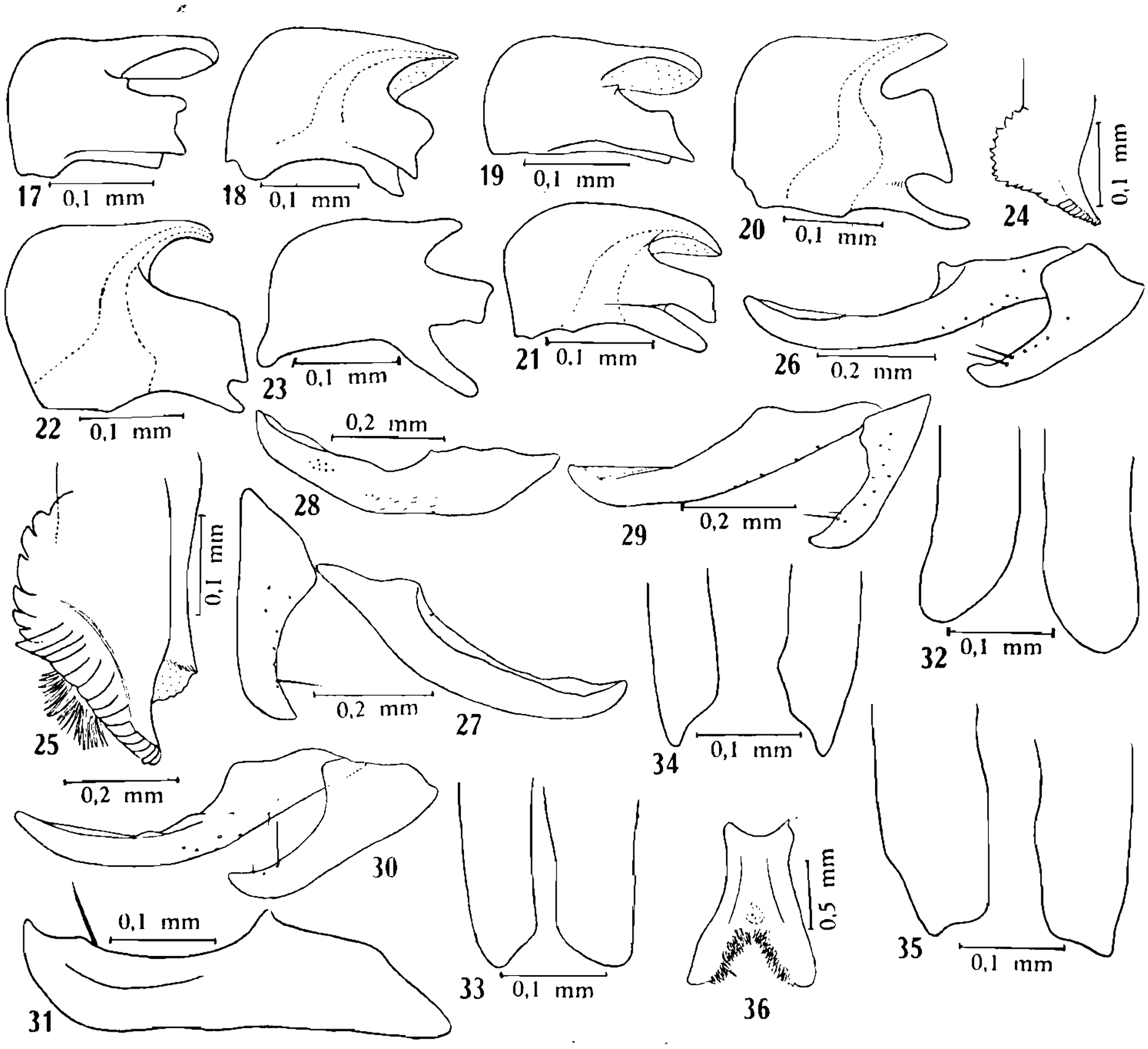
long hairs. *Forcipes superiores* reddish black, broad at apices where there is a short point and some strong spines lateraly; *forcipes inferiores* almost triangular, elongated; *forcipes interiores* curved apically, with a few preapical hairs; *palpi genitalium* long and curved with pointed, sometimes rounded apices. Penis with very large *ventralia*, spinous, bilobed, *paraphallus* well chitinized, with a pair of large, two-pointed lateral plates; apical plate overlapping *glans*, with a pair of long and slender lateral processes which are very variable in shape. *Glans* composed of a median pair of bars each with a lateral process, spined on outer side, which represents the *ductus ejaculatorius*.

Legs black; hind femur with two series of bristles on anterior side, inner one limited to basal two-thirds. Mid-tibia with one preapical bristle on ventral side; hind tibia with a long preapical bristle and two or three small bristles on ventral side. Segments of costal vein as follows: II:41, III:30, IV:58, V:27, VI:6.

Female: Length 7 to 12 mm. Front about 0,27 of width of head. Ocellar bristles well developed, outer vertical bristle about half the length of inner vertical bristle. Apical scutellar bristle absent. Genital segments black, silvery pollinose, sometimes the margin of tergite 6 plus 7 and entire membranous sternite IX reddish black; sternite VI plus VII with a submarginal row of strong bristles; sternite VIII with concave posterior margin and two bristles on each angle.

Distribution: China, Japan, Volcano Is., Bonin Is., Mariana Is., Formosa, Hainan, India, Ceylon, Australia, New Guinea, New Britain, Samoa, Gilbert Is. and Hawaii.

Port Arthur constitutes on the continent the most northern locality in which *peregrina* was found (ROHDENDORF, 1937); EYSELL (1915) studied specimens from South China and ILLINGWORTH (1926) refers the species as a very common fly south of the Yangtze river. PATTON & EVANS (1929), SEGUY (1941) and Ho (1940) refer specimens from China; Ho (1934) from Chekiang and Kiangsu and QUO (1952) from Shangai. In Japan the species was refered by ILLINGWORTH (1926) on the south, in Hokkaido (KANO, 1950), in Hokkaido and Honshu (KANO, SATO & TANGE, 1951), without specific locality (HORI, 1951), in Hachigo Is. (KANO, 1951), in Japan and Okinawa (KANO, 1957). SENIOR WHITE, AUBERTIN & SMART (1940) examined specimens from Tsuchima Is. (South of Corea). LOPES (1958) refers the species on Volcano Is., Bonin Is. and Mariana Is. BOETTCHER (1913) described the species as *fuscicauda* from Formosa; HENNIG (1941) refers to the same material. Ho (1936) examined specimens from Hainan. PARKER (1923) describes the species under the name of *hutsoni* from South India and Ceylon. SENIOR WHITE studied specimens from the same localities (1924, 1927 and 1930). SENIOR WHITE, AUBERTIN & SMART (1940) examined specimens from India and Ceylon. There are some records south of the above regions that require further confirmation: BOETTCHER (1913) refers specimens from Singapure. SENIOR WHITE examined material



Boettcherisca peregrina (Desvoidy), male — Fig. 17: Apical plate of *paraphallus* (nr. 8.563, Australia): fig. 18: idem (nr. 8.564, Hawaii); fig. 19: idem (nr. 8.516. Australia); fig. 20: idem (nr. 8.562; fndia); fig. 21: idem (nr. 8.569, Japan); fig. 22: idem (nr. 8.568, China); fig. 23: idem (nr. 8.590, Karavat); fig. 24: apex of *glans* (nr. 8.521, Australia); fig. 25: idem (nr. 8.562, India); fig. 26: internal forceps (nr. 8.516, Formosa); fig. 27: idem (nr. 8.521, Australia); fig. 28: idem (nr. 8.522, Hawaii); fig. 29: idem (nr. 8.523, India); fig. 30: idem (nr. 8.519, Japan); fig. 31: idem (nr. 8.591, Gilbert Is.); fig. 32: *palpi genitalium*, dorsal view (nr. 8.592, Bonin Is); fig. 33: idem (nr. 8.590, Karavat); fig. 34: idem (nr. 8.570, Agrihan); fig. 35: idem (nr. 8.591, Gilbert Is.); fig. 36: fifth sternite (nr. 8.516, Formosa).

from Burma, Andaman Is., Java and Borneo but at 1930 considers the specimens as belonging to *B. karnyi*. However Senior White, Aubertin & Smart (1940) reported as *fuscicauda* the specimens from Burma and included Riouw Arch. (Malaya), Singapure and Philippine Is. in the geographic distribution of *fuscicauda*. Ho (1940) refers also specimens from Riouw Arch. and Java. James (1947) included Perak in the distribution and Hori (1951) considers also material from Philippine Is. and Africa. It is necessary to examine specimens from those regions to establish which species occurs here. There is the possibility that two or more species can be found in the region. Desvoidy describes (1831) *peregrina* from Sydney, Australia. Bancroft (1920)

refer it as *frontalis* Thomson and JOHNSTON & TIEGS (1932) as *irrequieta* Walker and *peregrina* Desvoidy from Australia (Brisbane, N. S. Wales, W. Australia). The last authors indicate that "it will probably be found to occur in the East Indies and Philippines". JOHNSTON & HARDY (1923) examined specimens from Australia (Queensland, N. S. Wales and S. Australia). SENIOR WHITE studied material from Australia and ILLINGWORTH refers the species from Queensland south to Brisbane. JOHNSTON & TIEGS examined specimens from New Guinea and considered *S. tritonia* Macquart, described from the same locality, as a synonym of *peregrina*. I received specimens from New Britain. BEZZI (1928) found among specimens from Fiji one male reared "from onions imported from Australia". BUXTON (1929) studied larvae of this species collected in Samoa. I examined specimens from Gilbert Is. The species was recorded from Hawaii by TIMBERLAKE (1918), SENIOR WHITE (1924), GREENE (1925), ILLINGWORTH (1926), BRYAN (1934), SENIOR WHITE, AUBERTIN & SMART (1940), LOPES (1941) and HARDY (1952).

Specimens examined: China: Hangchou, male, 17-VI-1934 (col. I.O.C. nr. 8 568). Japan: Tokio, male, 8-IX-1953, R. Kano; male, Mt. Takanizu, V-1953, R. Kano (nr. 8 569; male, environs de Tokio 1901, J. Harmand. Formosa: Ta T'um Shau, male, 2 500 ft., 3-VI-1958, S. Kirner; Shell Beach, 25 mi from Taipe on Tansui Road, two males, female, 30-VII-1958, S. Kirner (nr. 8 516). Bonin Is.: Chichi Jima, male, Kiyose, 11-X-1934, M. Okabe & H. Ikeda; six males, Myianohama, "Jack Wms beach" 15 to 21-IV-1958, F. M. Snyder (nr. 8 591); three males, Okumara, "Yankee town", 12-V-1958, F. M. Snyder; male, female, Omura, "Camp beach", 2 to 25-IV-1958, F. M. Snyder (nr. 8 592); female, Ogiura, 8-IV-1958, F. M. Snyder; male, Sakaiura, "Bull beach", 2 to 5-IV-1958. Volcano Is.: Iwo Jima, two males, female, IX-1945, H. S. Dybas. S. Mariana Is.: Saipan, male, five females, Mt. Tagpochan, 25-XI-1944, Edgar; female, near Garapan, 7-V-1945, H. S. Dybas. India: Tranquebar beach, male, IV-1947, P. S. Nathan (nr. 8 523); Karikal, male, Korumbagarum, II-1947, P. S. Nathan, (nr. 8 562); Nilgiri Hills, male, Gadaluer, 3 500 ft., IV-1949, P. S. Nathan; Trichinopoli, male, 1920, J. Surcouf (nr. 8 566); Cote de Malabar, female, Nahé, 1902, M. Maindrou. Australia: Western Australia: three males, three females, VI-1939. New South Wales: male, female, Brisbane, III-1923, G. H. Hardy (reared); female, Kivara, 28-I-1936, M. F. Day. North Queensland: male, Cairns, J. F. Illingworth (ex human excrement); three males, two females, Townsville, G. F. Hill, (nr. 8 563). Northern Territory: two males, three females, Darwin, X-1950; male, three females, Katherine, IV-1950, W. Arndt (nr. 8 421). New Britain: two males, female, Karavat, via Rabaul, 10-III-1952, G. S. Dun (nr. 8 590). Fiji: female, Nadurulouiu, Viti Levu, 25-II-1949, O. Connor. Gilbert Is.: Tarava At.: two males, Bairiti I-XI-1957, N. L. H. Krauss; male, female, Betio, 1-XI-1957, N. L. H. Krauss (nr. 8 591). Hawaii: Kauai: four males, six females, Kapaa, 21-XII-1940, F. C. Haldaway

(ex manure, all specimens with pupae); female, Kobee, 7-VII-1932, O. H. Swezey; Oahu: Honolulu: six males, six females, J. F. Illingworth; females, 12-IV-1932, G. T. Schmidt; male, IV-1950, D. E. Hardy (ex *Cassia alata*); two females, Manon Wallei, 1-6-IV-1953; Oahu: three males, two females, Maunavili, XII-1950, P. L. Cow (in bait traps); male, 26-XI-1951, H. H. Severin; two females, I-1951, J. F. Illingworth; male, Waianae, II-1952, D. E. Hardy; two males, female, 14-IV-1946, Y. Yanada (ex manure); female, Palclo, J. F. Illingworth; male, female, Welch (on rotting shells) (nr. 8 421 and 8 422).

The specimens examined are deposited in the collection of the Instituto Oswaldo Cruz or are returned to the Hawaiian University, Hawaii, and to the Division of Entomology, Camberra, Australia. We are indebt to Dr. D. E. Hardy by the opportunity to examine a good series of specimens from Hawaii.

Myophora peregrina was described by DESVOIDY (1930) from Port Jackson (Sydney) and the author describes *M. subrotunda* and *M. rapida,* from the same locality, considered by the Australian authors as synonymy of the first species. *Sarcophaga tritonia* Macquart from Triton Bay, Dutch New Guinea, was considered by JOHNSTON & TIEGS (1922:177) as *B. peregrina.* These authors examined specimens from British New Guinea and I reported *B. peregrina* in New Britain. However, the above synonymy must be considered with reserve. Also *S. ochripalpis* Thomson, described from Sydney, was placed under the same species by JOHNSTON & TIEGS (1921:65). BOETTCHER describes *Sarcophaga fuscicauda* from Formosa and, for the first time, the genital features of male are figured. The species was known under this name for many years. When the Australian authors begin to study the species they identified it as *S. frontalis* Thomson (JOHNSTON & BANCROFT, 1920), *S. irrequieta* Walker (JOHNSTON & TIEGS, 1921) and, at last, as *S. peregrina* (JOHNSTON & TIEGS, 1922). PARKER (1923) described the species as *S. hutsoni,* from India and Ceylon and HARDY (1932) considered the Indian specimens belonging to a different species. Even though the Indian specimens I saw present some differences in the apical plate of the *paraphallus,* I was unable to find the differences pointed out by HARDY and I consider *hutsoni* a synonym of *peregrina.* SENIOR-WHITE (1924) included *hutsoni* under the name *fuscicauda.*

The main characters for distinguishing *B. peregrina* and *B. karnyi* are found in the male genitalia. The *palpi genitalium* of *B. peregrina* are pointed or rounded at the apex and do not present the apical flap we can observe in *B. karnyi.* However these features are little conspicuous in the specimens of *B. karnyi* I examined from Agriham (Mariana Is.) (fig. 41). In addition to this character the specimens of *B. peregrina* always present the basal lobe of the ventralia much more developed than in *B. karnyi.* The shape of the *palpi genitalium,* in dorsal view, is very variable (figs. 31 to 34). The apical plate of the *paraphallus* shows a great degree of variation (figs. 16 to 22).

Boettcherisca karnyi (Hardy, 1927) (Figs. 37-43)

Sarcophaga fuscicauda S. White, 1924: 252, partim (Burma, Andaman Is., Java and Borneo)
Sarcophaga karnyi Hardy, 1927: 454, fig. 7 (Java)
Sarcophaga karnyi S. White, 1930: 74 (Burma, Andaman Is. and Borneo)
Sarcophaga karnyi Hardy, 1932: 45 (Java)
Sarcophaga karnyi S. White, Aubertin & Smart, 1940: 273, fig. (Burma, Andaman Is., Java and Borneo)
Sarcophaga peregrina Hall & Bohart, 1940: 129, 131, pl. 13 (Guam, pupae)
Sarcophaga near *peregrina* Bohart & Gressitt, 1951: 136, pl. 8, 17 (Guam, larva III, pupae)
Boettcherisca karnyi Lopes, 1958: 32, fig. 7 (Mariana Is., Caroline Is., Wake, Marshall Is., male, female, larva I)

Male: Length 8 to 12 mm. Front about 0,20 to 0,22 of width of head. Second antennal segment about 0,4 as long as third, the latter reaching 0,8 of distance to vibrissae. *Palpi genitalium* with preapical broad flange near the apex which is sometimes poorly developed. Digitiform apophysis of base of *ventralia* much more reduced than in *peregrina*. Apical plate of *paraphallus* variable (fig. 39).

Female: Length 6 to 12 mm. Front about 0,28 of width of head. Spermatheca a little more elongate than in *peregrina*.

Geographical distribution: Burma, Andaman Is., Java, Borneo, Cocos Is., Mariana Is., Caroline Is., Wake and Marshall Is.

Specimens examined: In addition to the material studied in 1958 I have examined two males and two females from Cocos Is., West Island, 25-31-V-1952, T. G. Campbell.

The species has been observed by Senior-White (1924) when this author reported specimens he considered as *fuscicauda* but having "anterior clasper furcate" (Java and Borneo). Three years later, Hardy described *karnyi* from Java and Senior-White (1930) considered the specimens from Burma, Andaman Is. and Borneo as belonging to Hardy's species. Senior-White, Aubertin & Smart (1940) included Hawaii in the distribution of *karnyi* but I examined many specimens from these Islands and never found this species. Hall & Bohart (1948) studied specimens from Guam describing the pupae. Bohart & Gressitt (1951) described larvae and puparium. Lopes (1958) examined material from Micronesia.

Boettcherisca septentrionalis Rohdendorf, 1937

Boettcherisca (Notochaetomima) septentrionalis Rohdendorf, 1937: 271, 273, 459; figs. 376, 377 (Vladivostock, male)
Sarcophaga septentrionalis Kano, 1951: 223, figs. 1-11 (Hachigo Is., Japan, male, female, larvae I to III)

Male: Length 8 to 13. Differs from *peregrina* mainly by the straight anterior margin of *ventralia* and by the well chitinized apical plate

of the *paraphallus*. The apex of the *forcipes superiores* presents long hairs in the figure given by ROHDENDORF and there are also small spines ("kleine Apicalsahn" of ROHDENDORF description).

Female: Length 8 to 12 mm. Eighth abdominal sternite somewhat different from that of *peregrina*, ninth tergite vestigial, represented by a pair of small and round, heavily pigmented plates. The above description is based on figures given by KANO.

Geographical distribution: U.R.S.S. and Japan.

Boettcherisca formosensis Kiener & Lopes, 1961

Boettcherisca formosensis Kiener & Lopes, 1961: 65, figs. 1-9 (Formosa)

This species is easily distinguished by the straight anterior margin of the ventralia, by the membranous apical plate of the *paraphallus* and by the female tergite 6 plus 7 formed by two pieces.

Geographical distribution: Formosa.

Boettcherisca javanica sp. n.

(Figs. 44-49)

Male: Length 13 mm. Differs from *peregrina* as follows: head slightly yellow pollinose, genae and back of head silver colored. Front about 0,2 of width of head. Five frontal bristles divergent and situated below base of antennae. Second antennal segment reddish black, about 0,4 as long as third, the latter reaching about 0,86 of distance to vibrissae. Back of head with two rows of black bristles in addition to postocular cilia. Parafacialia with 0,5 of the distance between vibrissae. *Forcipes superiores* with numerous small spines covering the apical half and extending to the dorsum of the *forcipes*. Penis with small rounded *ventralia*, apical plate membranous with long basal apophysis, glans very spinous, almost straight. Hind tibia with two strong ventral bristles. Segments of costal vein as follows: II:47, III:30, IV:61, V:22, VI:7. Fifth segment short, sixth very elongate.

Holotype male, Soekaboemie, Java, "Croisière du Nirvana" coll. Contesse de Béarn, E. Cordier, V-1908 (I.O.C. nr. 8 565).

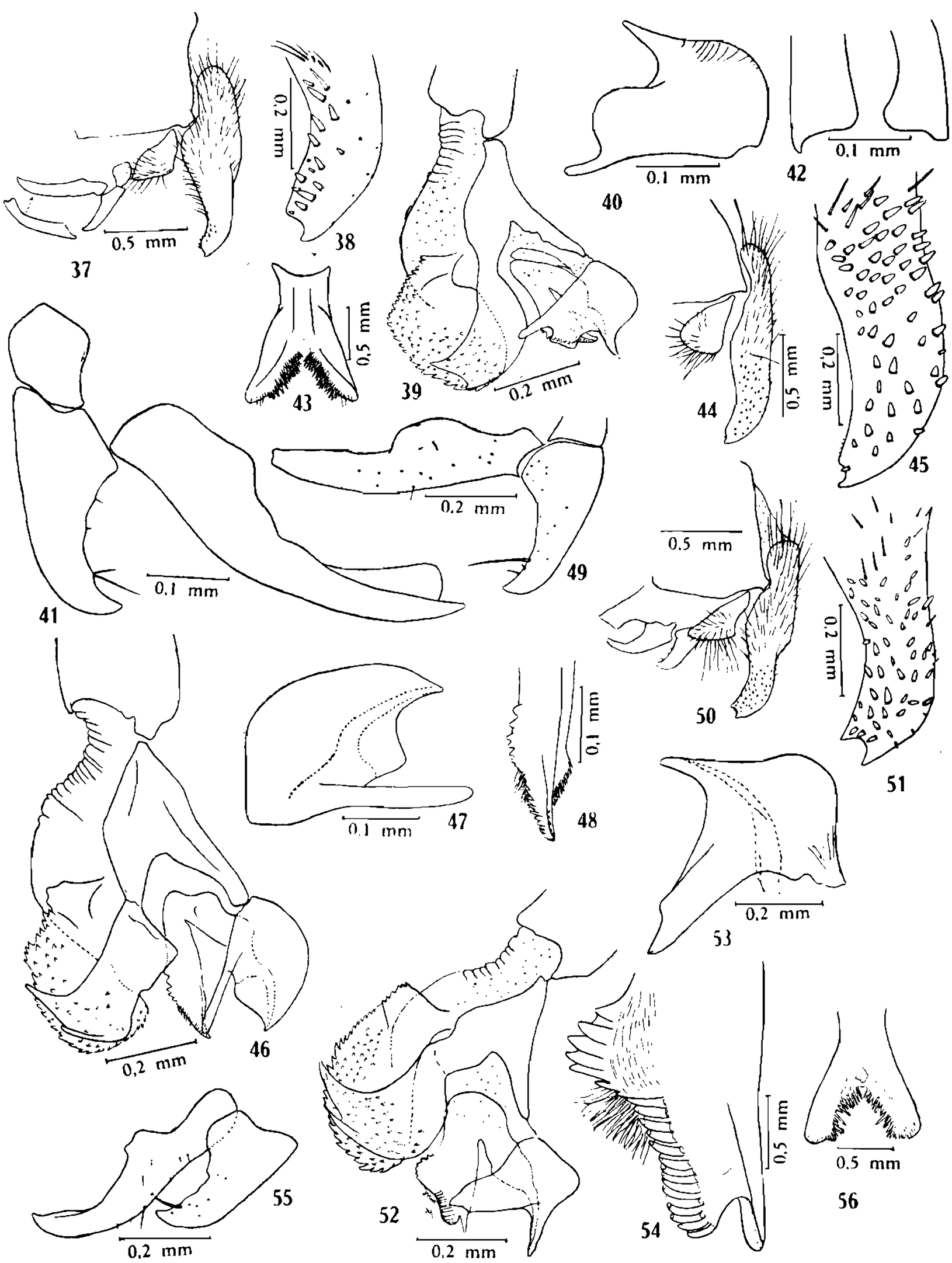
Boettcherisca nathani sp. n.

(Figs. 50-56)

Male: Length 9 mm. Differs from *peregrina* as follows: Front about 0,24 of width of head. Second antennal segment reddish black, about 0,5 as long as third, the latter reaching about 0,89 of distance to vibrissae. Back of head with two series of black bristles in addition to the postocular cilia. Parafacialia about 0,4 of the distance between vibrissae. *Forcipes superiores* with numerous spines on apical third, extending to the dorsum of the *forcipes*. *Ventralia* large with small basal digitiform process. Apical plate of *paraphallus* membranous. Glans

with excised apex. Hind tibia only with one long preapical bristle. Segment of costal vein as follows: II:41, III:27, IV:50, V:26, VI:4.

Holotype male, Karikal, Korumbagaram, South India, P. S. Nathan (I.O.C. nr. 8 420).



Boettcherisca karnyi (Hardy), male — Fig. 37: Genitalia; fig. 38: apex of *forcipes superiores* (nr. 8.518, Marshall Is.); fig. 39: penis (nr. 8.518); fig. 40: apical plate of paraphallus (nr. 8.589, Agrihan); fig. 41: internal forceps (nr. 8.436, W. Caroline Is.); fig. 41: *palpi genitalium*, dorsal view (nr. 8.589, Agrihan); fig. 43: fifth sternite. *Boettcherisca javanica* sp. n., male — Fig. 44: external forceps; fig. 45: apex of *forcipes superiores;* fig. 46: penis; fig. 47: apical plate of *paraphallus;* fig. 48: apex of *glans;* fig. 49: internal forceps. *Boettcherisca nathani* sp. n., male — Fig. 50 — Genitalia; fig. 51: apex of *forcipes superiores;* fig. 52: penis; fig. 53: apical plate of *paraphallus;* fig. 54: apex of *glans;* fig. 55: internal forceps; fig. 56: fifth sternite.

Boettcherisca atypica (Baranov, 1934)

Athyrsia atypica Baranov, 1934: 183, fig. 1
Athyrsiola atypica Baranov, 1938: 174

Male: Length 7 mm. *Forcipes superiores* much curved apically, lateral plates of *paraphallus* apparently without apical sharp points, *ventralia* reduced. (Characters from BARANOV figures).

Known only from the type material: two males from Festiva, Isabel Is. and Tulagui, Solomon Is.

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