SARCOPHAGID FAUNA (DIPTERA : SARCOPHAGIDAE) OF MAHARASHTRA, INDIA

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INTRODUCTION

Senior-White (1924) reported a total of eight species, viz., Sarcophaga peregrina R. D., Sarcophaga ruficornis Fabricius, Sarcophaga dux Thomson, Sarcophaga albiceps Meigen, Sarcophaga knabi Parker, Sarcophaga orchidea Boettcher, Sarcophaga futilis Senior-White and Sarcophaga krameri Boettcher from Maharashtra. Nandi (1988) reported Thyrsocnema (Pseudothyrsocnema) indica Shinonaga and Lopes from Mahabaleshwar, Maharashtra. The author collected these flies from different parts of this state in 1990 and reported a total of twentyone species.

ABBREVIATIONS USED IN THE TEXT

ac-acrostichal bristles, dc-dorsocentral bristles, ia-intra-alar bristles, h-humeral bristles, ph-posthumeral bristles, np-notopleural bristles, sa-supra-alar bristles, pa-postalar bristles, st-sternopleural bristles, mpl-mesopleural bristles, hpl-hypopleural bristles.

ABBREVIATIONS USED IN THE FIGURES

ap-apical plate of paraphallus, lp-lateral plate of paraphallus, p-paraphallus, s-styli of glans, t-theca of penis, v-ventralia of penis.

The type materials will be deposited in the National Collection of Zoological Survey of India, Calcutta, in due course.

SYSTEMATIC ACCOUNT

Subfamily : Sarcophaginae
Tribe : Tephromyiini

1. Blaesoxipha aldrichi Nandi

1992. Blaesoxipha aldrichi Nandi, Hexapoda, 4(1) : 65.

Material examined : 2 ♂ ♂ , Nagpur Seminary Hills, 350 m., 14. vi. 1990.

This species is recorded for the first time from this state.

Distribution : Karnataka ; Kaimara, Maharashtra ; Nagpur Seminary Hills.
2. **Boettcherisca bengalensis** Nandi

1992. *Boettcherisca bengalensis* Nandi, *J. Beng. nat. Hist. Soc.*, 11 (1) : 35.

*Material examined:* 2♀♂, Nagpur Maharajabagh, 314 m., 13. vi. 1990; 1♀, Nagpur Seminary Hills, 350 m., 14. vi. 1990; 1♂, Aurangabad Siddhartha Garden, 350 m., 18. vi. 1990.

This species records for the first time from this state.

*Distribution:* Maharashtra; Nagpur Seminary Hills, Nagpur Maharajabagh, Aurangabad Siddhartha Garden, West Bengal; Bankura, Birbhum, Midnapore.

3. **Boettcherisca nathani** Lopes

1961. *Boettcherisca nathani* Lopes, *Mem. Inst. Oswaldo Cruz.*, 59 (1) : 79.

*Material examined:* 1♂, Khandala, 960 m., 21. vi. 1990.

This is the first record of this species from this state.

*Distribution:* Maharashtra; Khandala, Tamil Nadu; Karikal (Korumbagaram), West Bengal; Darjeeling.

4. **Boettcherisca peregrina** (Robineau-Desvoidy)

1830. *Myophora peregrina* Robineau—Desvoidy, *Mém. Prés. Acad. Sci. Inst. Fr.*, (2) 2 : 356.

1992. *Boettcherisca peregrina* : Nandi, *J. Beng. nat. Hist. Soc.*, 11 (1) : 38.

*Material examined:* 1♂, Aurangabad Siddhartha Garden, 350 m., 18. vi. 1990.

5. **Parasarcophaga** (Liopygia) *ruficornis* (Fabricius)

1794. *Musca ruficornis* Fabricius, *Ent. Syst.*, 4 : 314.

1991. *Parasarcophaga* (Liopygia) *ruficornis* : Nandi, *J. Beng. nat. Hist. Soc.*, 10 (2) : 39.

*Material examined:* 1♂, Pune Rly. Station area, 559 m., 19. vi. 1990.

6. **Parasarcophaga** (Liosarcophaga) *brevicornis* (Ho)

1934. *Sarcophaga brevicornis* Ho, *Bull. Fan. meml. Inst. Biol.*, 5 : 23.

1991. *Parasarcophaga* (Liosarcophaga) *brevicornis* : Nandi, *J. Beng. nat. Hist. Soc.*, 10 (2) : 39.

*Material examined:* 2♂♂, Nagpur Maharajabagh, 314 m., 13. vi. 1990; 1♀, Nagpur Seminary Hills, 350 m., 14. vi. 1990; 1♂, Ellora, 370 m., 17. vi. 1990; 1♂, Aurangabad Siddhartha Garden, 350 m., 18. vi. 1990; 1♂, Lonavale, 950 m., 21. vi. 1990.

It is recorded for the first time from this state.
7. Parasarcophaga (Liosarcophaga) dux (Thomson)

1868. Sarcophaga dux Thomson, *K. svenska Fregatten Eugenies Resa.*, p. 534.
1991. Parasarcophaga (Liosarcophaga) dux : Nandi, *J. Beng. nat. Hist. Soc.*, 10 (2) : 39.

*Material examined:* 1 ♂, Nagpur Seminary Hills, 350 m., 14. vi. 1990 ; 3 ♂ ♀, Ajanta, 533 m., 16. vi. 1990 ; 1 ♂, Ellora, 370 m., 17. vi. 1990 ; 2 ♂ ♀, Aurangabad Siddhartha Garden, 350 m., 18. vi. 1990 ; 4 ♂ ♀, Panchgani, 380 m., 20. vi. 1990.

8. Parasarcophaga (Pandelleisca) ballardi (Senior-White)

1924. Sarcophaga ballardi Senior—White, *Rec. Indian Mus.*, 26 (3) : 254.
1977. Parasarcophaga (Pandelleisca) ballardi : Lopes, Kano, Shinonaga and Kurahashi, *Cat. Dipt. Orient. Region*, 3 : 570.

*Material examined:* 1 ♂, Daulatabad, 340 m., 17. vi. 1990.

It is new record for the state.

9. Parasarcophaga (Pandelleisca) kurahashii Nandi

1992. Parasarcophaga (Pandelleisca) kurahashii Nandi, *Hexapoda*, 4(1) : 71.

*Material examined:* 1 ♂, Nagpur Seminary Hills, 350 m., 14. vi. 1990 ; 1 ♂, Daulatabad, 340 m., 17. vi. 1990 ; 2 ♂ ♀, Panchgani, 380 m., 20. vi. 1990.

This is the first record of this species from this state.

*Distribution:* Karnataka ; Mysore Zoo., Maharashtra ; Nagpur Seminary Hills, Daulatabad, Panchgani.

10. Parasarcophaga (Parasarcophaga) albiceps (Meign)

1826. Sarcophaga albiceps Meigen, *Syst. europ. zweifl. Insekten.*, 5 : 22.
1991. Parasarcophaga (Parasarcophaga) albiceps : Nandi, *J. Beng. nat. Hist. Soc.*, 10 (2) : 39.

*Material examined:* 1 ♂, Nagpur Maharajabagh, 314 m., 13. vi. 1990 ; 1 ♂, Nagpur Seminary Hills, 350 m., 14. vi. 1990 ; 1 ♂, Aurangabad Siddhartha Garden, 350 m., 18. vi. 1990 ; 1 ♂, Pune Rly. Station area, 559 m., 19. vi. 1990 ; 3 ♂ ♀, Khandala, 960 m., 21. vi. 1990.

11. Parasarcophaga (Parasarcophaga) hirtipes (Wiedemann)

1830. Sarcophaga hirtipes Wiedemann, *Aussereurop. zweifl. Insekten.*, 2 : 361.
1990. Parasarcophaga (Parasarcophaga) hirtipes : Nandi, *J. Beng. nat. Hist. Soc.*, 9 (2) : 17.

*Material examined:* 1 ♂, Nagpur Maharajabagh, 314 m., 13. vi. 1990 ; 2 ♂ ♀, Nagpur Seminary Hills, 350 m., 14. vi. 1990 ; 2 ♂ ♀, Ajanta, 533 m., 16. vi. 1990 ; 2 ♂ ♀, Ellora, 370 m., 17. vi. 1990 ; 3 ♂ ♀, Daulatabad, 340 m., 17. vi. 1990 ; 4 ♂ ♀, Aurangabad Siddhartha Garden, 350 m., 18. vi. 1990 ; 1 ♂, Pune Rly. Station area,
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559 m., 19. vi. 1990; 1 ♂, Mahabaleshwar, 1, 362 m., 20. vi. 1990; 2 ♂ ♂, Wai, 680 m., 20. vi. 1990.

It is a new record for the state.

12. Parasarcophaga (Parasarcophaga) sericea (Walker)

1853. *Sarcophaga sericea* Walker, *Ins. Saunders.*, *Dipt.*, **4**: 326.
1917. *Sarcophaga knabi* Parker, *Proc. U. S. natn. Mus.*, **54**: 96.
1990. *Parasarcophaga (Parasarcophaga) knabi* : Nandi, *J. Beng. nat. Hist. Soc.*, **9** (**2**): 17.
1989. *Parasarcophaga (Parasarcophaga) sericea* : Lopes, *Cat. Dipt. Australasia and Oceania Regions*, p. 728.

*Material examined*: 1 ♂, Ajanta, 533 m., 16.vi. 1990; 1 ♂, Ellora, 370 m., 17.vi. 1990; 1 ♂, Daulatabad, 340 m., 17.vi. 1990; 1 ♂, Aurangabad Siddhartha Garden, 350 m., 18.vi. 1990; 1 ♂, Pune Rly. Station area, 559 m., 19.vi. 1990; 1 ♂, Khandala, 960 m., 21.vi. 1990.

13. Parasarcophaga (Parasarcophaga) misera (Walker)

1849. *Sarcophaga misera* Walker, *List. Dipt. Brit. Mus.*, **4**: 829.
1913. *Sarcophaga orchidea* Böettcher, *Annls hist-nat. Mus. natn. Hung.*, **11**: 375.
1990. *Parasarcophaga (Parasarcophaga) orchidea* : Nandi, *J. Beng. nat. Hist. Soc.*, **9** (**2**): 18.
1989. *Parasarcophaga (Parasarcophaga) sericea* : Lopes, *Cat. Dipt. Australasia and Oceania Regions*, p. 728.

*Material examined*: 2 ♂ ♂, Nagpur Seminary Hills, 350 m., 14.vi. 1990; 2 ♂ ♂, Ajanta, 533 m., 16.vi. 1990; 2 ♂ ♂, Ellora, 370 m., 17.vi. 1990; 2 ♂ ♂, Lonavale, 950 m., 21.vi. 1990.

Subtribe: Helicophagellina

14. Pierretia (Ascelotella) calicifera (Böettcher)

1912. *Sarcophaga calicifera* Böettcher, *Ent. Mitt.*, **1**: 169.
1988. *Pierretia (Ascelotella) calicifera* : Nandi, *J. Beng. nat. Hist. Soc.*, **7** (**1**): 21.

*Material examined*: 1 ♂, Nagpur Seminary Hills, 350 m., 14.vi. 1990. It records for the first time from this state.

15. Thyrsocnema (Pseudothyrsocnema) indica Shinonaga and Lopes

1975. *Thyrsocnema (Pseudothyrsocnema) indica* Shinonaga and Lopes, *Pacif. Insects*, **16** (**4**): 459.

*Material examined*: 1 ♂, Ellora, 370 m., 17.vi. 1990; 1 ♂, Daulatabad, 340 m., 17.vi. 1990; 3 ♂ ♂, Panchgani, 1, 132 m., 20.vi. 1990.
16. **Kozlovea vervesi** sp. nov. (Figs. 1-5)

*Male*: Body length 8-10 mm.

*Head*: Width of frons about half that of one eye; frontal vitta black, its width at narrowest point of frons about more than twice that of each parafrontal; parafrontal and parafacial black with silvery pollen, the former with short scattered hairs, the latter with a now of 7 hairs near the eye margin; antennae blackish-brown, reaching to about 0.85 distance to vibrissae, 1st and 2nd segments black with short black hairs and spines, 3rd brownish with silvery pollen, its length about twice that of the 2nd; arista long plumose along basal two-thirds; facial ridge brownish with silvery pollen.

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**Fig. 1-5.** *Kozlovea vervesi* sp. nov.
1, inner and outer forceps, lateral view; 2, same, posterior view; 3, fifth sternite; 4, penis, lateral view; 5, same, ventral view.
and long hairs; vibrissae long, distance between vibrissae equal to the parafacial width; frontal bristles 10, upper 2 reclinate, lower 3 below base of antennae and reaching to about half of the 2nd antennal segment, rest cruciate and directed forwards; gena black with long hairs; post gena black with long hairs; ocellar triangle black with short black hairs; outer vertical moderately developed; inner vertical well developed; post vertical equal to the ocellar and about one-third the inner vertical; two rows of regular postocular setae besides postocular cilia, rest of the area with short brownish hairs; palpi slender, blackish; proboscis black.

**Thorax**: Blackish with three black longitudinal stripes; ac 0+1; dc 5+4; ia 1+3; ps 1; h 3; ph 2; np 4; sa 3; pa 2; st 1+1+1; mpl 7; hpl 6; upper part of propleura bare; prostigmatic and propleural bristles well developed and accompanied with short hairs; pro- and mesothoracic spiracles brown; apicoscutellar bristles well developed, 1 pair; discoscutellar bristles wanting; lateroscutellar bristles well developed, 2 pairs.

**Wings**: Hyaline with brown veins; R₁ bare; R₄+₅ with a row of short setae located dorsally and extending up to two-thirds the distance from the basal node r-m and 5 short setae present on ventral surface of basal node of R₄+₅; 3rd costal segment greater than 5th, the latter with short spines along more than basal half of its anterior margin; costal spines stout; epaulet yellowish with short spines; basicostal scale brownish; squama whitish; halter brownish.

**Legs**: Black; fore femur with two rows of bristles along posterodorsal surface and a row of bristles along posterior margin of ventral surface; fore tibia with a row of 3 bristles along basal one-third of anterodorsal surface and 1 bristle on posterodorsal surface at about one-third the distance from the distal end; mid femur with a row of bristles along anterolateral surface, a row of bristles along basal half of anteroventral surface and with comb-like spines along distal half of anteroventral and posteroverventral surfaces, a row of long hairs along basal two-thirds of posteroverventral surface and 1 bristle each on posterodorsal, posterolateral and posteroverventral surfaces at about one-third the distance from the distal end; mid tibia with 1 bristle each on anterodorsal surface at about one-third and two-thirds the distances from the distal end, a row of bristles along basal half of posterolateral surface and 1 bristle on posteroverventral surface at about one-third the distance from the distal end; hind femur with 2 rows of bristles along anterolateral surface, a row of bristles along anteroventral surface at about one-third the distance from the distal end, 1 bristle each on posterodorsal and posterolateral surfaces at about one-fifth the distance from the distal end and with long hairs along ventral surface; hind tibia with 1 bristle each on anteroventral and posteroverventral surfaces at about one-third and two-thirds the distances from the basal end, 3 bristles along posterodorsal surface at about three-
fourths the distance from the basal end, 1 bristle on anteroventral surface at about one-third the distance from the distal end and with numerous long hairs along anterior and posterior margins of ventral surface.

**Abdomen**: Black with silvery checkered pattern; median marginal bristles on 2nd and 3rd abdominal tergites absent but 2nd with 2 and 3rd with 1 lateral marginal bristles; 4th tergite with 2 median marginal bristles; 5th with a row of 16 marginal bristles; 1st to 4th sternites with short hairs; 5th sternite v-shaped with long hairs and bearing two knob-like projections basally; 1st and 2nd genital segments brownish and without marginal bristles; inner forcep elongated, slightly curved and pointed at end; outer forcep slightly elongated; anterior paramere elongated with slight projection at the middle; posterior paramere deeply curved at end, pointed and with single hair; theca shorter than paraphallus, both are sclerotised; apical plate of paraphallus curved, pointed at end; lateral plate of paraphallus blunt at end; ventralia elongated and membranous.

**Female**: Unknown.

**Holotype**: 1♂, Nagpur Seminary Hills, 350 m., 14.vi. 1990; **Paratype**: 1♂, Khandala, 960 m., 21.vi. 1990.

**Remarks**: This species closely resembles *Kozlovea cavangarei* Nandi but differs from it by the structures of apical plate of paraphallus and ventralia as well.

**Bionomics**: This species was collected from bushes underneath the hill trees.

This species is named after Yu. G. Verves of U.S.S.R.

**Subtribe**: HARPAOOPHALLINA

17. **Harpagophalla panchganiensis** sp. nov.

(Figs. 6-9)

**Male**: Body length 8 mm.

**Head**: Width of frons about two-fifths that of one eye; frontal vitta black, its width at narrowest point of frons about less than each parafrenal; parafrenal and parafacial black with golden pollen, the former with short scattered hairs, the latter with a row of 6 short black hairs near the eye margin; antennae blackish-brown, reaching to about 0.8 distance to vibrissae, 1st and 2nd segments black with black hairs, the latter with 1 long hair, 3rd segment black with silvery pollen, its length about three times that of the 2nd; arista long plumose along basal two-thirds; facial ridge brownish with golden pollen and with few short hairs; frontal bristles 10, upper 2 reclinate, lower 2 below base of antennae and reaching to about half of the 2nd antennal segment, rest cruciate and directed forwards; gena black with very short black hairs and with golden pollen; post gena black with long greyish hairs; outer
vertical absent; inner vertical well developed; post vertical short, half the length of inner vertical; ocellar triangle black with short black hairs; two rows of regular postocular setae besides postocular cilia, rest of the area with black and white hairs; palpi slender, black; proboscis blackish.

Figs. 6-9. *Harpagophalla panchganiensis* sp. nov.
6, inner and outer forceps, lateral view; 7, same, posterior view; 8, penis lateral view; 9, same, ventral view.

**Thorax:** Black with three black longitudinal stripes; *ac* 0+1; *dc* 5+5 (post. *dc* stout); *ia* 0+2; *ps* 1; *h* 3; *ph* 3; *np* 3; *sa* 3; *pg* 2; *st* 1+1+1; *mpl* 6; *hpl* 9; upper part of propleura bare with silvery pollen; prostigmatic and propleural bristles well developed and accompanied with short hairs; pro-and mesothoracic spiracles brownish; apicoscutellar and discoscutellar bristles well developed, 1 pair each, the former is longer; lateroscutellar bristles 2 pairs.
Wings: Hyaline with brown veins; R_{1} bare; R_{4+5} with a row of short setae located dorsally and extending up to two-thirds the distance from the basal node to r-m and 4 short setae present on ventral surface of basal node of R_{4+5}; 3rd costal segment greater than the 5th, the latter with spines along basal half of its anterior margin; costal spines almost stout; basicostal scale yellowish; epaulet black with short spines; squama whitish; halter brown.

Legs: Black; fore femur with two rows of bristles along posterior dorsal surface and a row of bristles along posterior margin of ventral surface; fore tibia with a row of 3 short bristles along basal one-third of anterodorsal surface, 1 short bristle on posterodorsal surface and 1 on posterolateral surface at about one-third the distance from the distal end; mid femur with a row of 3 short bristles along one-third of anterolateral surface from basal end; a row of short setae along anteroventral and posteroventral surfaces at about one-third the distance from the distal end, 2 long bristles each on posterodorsal and posterolateral surfaces on distal end and with long hairs posteroventrally along basal half; mid tibia with 2 bristles medially on anterolateral surface, 3 bristles along posterodorsal surface on basal one-third, 1 bristle each on posterodorsal, anteroventral and posterolateral surfaces at about one-third the distance from the distal end; hind femur with 2 rows of bristles along anterolateral surface, a row of bristles along anterior and posterior margins of ventral surface and 1 bristle on distal part of posterodorsal surface; hind tibia with a row of bristles along anterodorsal surface, 3 bristles along posterodorsal surface on two-thirds the distance from the basal end, 1 bristle on anteroventral surface at about one-fourth the distance from the distal end and with long hairs along anterior and posterior margins of ventral surface.

Abdomen: Black with silvery checkered pattern; median marginal bristles on 2nd and 3rd abdominal tergites absent but each with 1 lateral marginal bristle; 4th tergite with a pair of median and 3 lateral marginal bristles; 5th tergite with a row of 18 marginal bristles; 1st to 3rd sternites with tuft of short hairs; 4th and 5th sternites with short hairs basally and numerous short spines distally; 1st and 2nd genital segments brown and without marginal bristles; inner forcep almost straight, curved at end, beak-shaped and provided with long hairs on subbasal end; outer forcep elongated with long hairs; anterior paramere slightly curved at end; posterior paramere slightly curved at end and without hairs; theca shorter than paraphallus, both are sclerotised; apical plate of paraphallus elongated; ventralia long, broad with five elongated branched processes and two subbasal spinous projections; styl of glans short and trilobed.

Female: Unknown.

Holotype: 1♂, Panchgani, 1,732 m., 20. vi. 1990.
Remarks: This species closely resembles *Harpagophalla talonata* (Senior-White) but differs from it by the structures of apical olate of paraphallus and ventralia. The structure of lateral plate of paraphallus is also quite different.

Bionomics: This species was collected from bush-sweeping.

18. *Iranihindia futilis* (Senior-White)

1924. *Sarcophaga futilis* Senior-White, *Rec. Indian Mus.*, 26 (3): 246.
1990. *Iranihindia futilis*: Nandi, *J. Beng. nat. Hist. Soc.*, 9 (2): 19.

*Material examined:* 1 ♂, Nagpur Seminary Hills, 350 m., 14. vi. 1990; 8 ♂ ♂, Ellora, 370 m., 17. vi. 1990; 14 ♂ ♂, Daulatabad, 340 m., 17. vi. 1990; 1 ♂, Aurangabad Siddhartha Garden, 350 m., 18. vi. 1990; 3 ♂ ♂, Lonavale, 950 m., 21. vi. 1990.

19. *Iranihindia martellata* (Senior-White)

1924. *Sarcophaga martellata* Senior-White, *Rec. Indian Mus.*, 26 (3): 47.
1992. *Iranihindia martellata*: Nandi, *Hexapoda*, 4(1) : 77.

*Material examined:* 1 ♂, Nagpur Seminary Hills, 350 m., 14. vi. 1990; 1 ♂, Lonavale, 950, 21. vi. 1990.

It is recorded for the first time from this state.

20. *Iranihindia martellatoides* (Baranov)

1931. *Sarcophaga martellatoides* Baranov, *Konowia*, 10 : 114.
1992. *Iranihindia martellatoides*: Nandi, *Hexapoda*, 4(1) : 77.

*Material examined:* 1 ♂, Ellora, 370 m., 17. vi. 1990; 1 ♂, Daulatabad, 340 m., 17. vi. 1990; 1 ♂, Aurangabad Siddhartha Garden, 350 m., 18. vi. 1990.

This is the first record of this species from this state.

Subtribe: *Seniorwhiteina*

21. *Seniorwhitea reciproca* (Walker)

1856. *Sarcophaga reciproca*, Walker, *J. Proc. Linn. Soc. Lond., Zool.*, 1 : 22.
1912. *Sarcophaga krameri* Böettcher, *Ent. Mitt.*, 1 : 165.
1990. *Seniorwhitea krameri*: Nandi, *J. Beng. nat. Hist. Soc.*, 9 (2) : 20.
1989. *Seniorwhitea reciproca*: Lopes, *Cat. Dipt. Australasia and Oceania Regions*, p. 730.

*Material examined:* 1 ♂, Khandala, 960 m., 21. vi. 1990.

**Summary**

Systematic position of twentyone species are dealt with. Two new species, *viz.*, *Kozlovea vervesi* and *Harpagophalla panchganiesis* are described and figured. Ten species are recorded for the first time from this state.
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