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MUSCA NEVILLI SP. NOV. (DIPTERA, MUSCIDAE), A DUNG-BREEDING FLY FROM SOUTH AFRICA

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ABSTRACT

KLEYNHANS, K. P. N., 1987. *Musca nevilli* sp. nov. (Diptera, Muscidae), a dung-breeding fly from South Africa. *Onderstepoort Journal of Veterinary Research*, 54, 115–118 (1987).

The adults, puparium and 3rd instar larva of a dung-breeding fly, *Musca nevilli* sp. nov. are described in the subgenus *Eumusca*. The adults are characterized by 4 dark postsutural mesonotal vittae, 1–2 bristles dorsally on the stem vein, the hairs on the ventral surface of *r4+5* confined to the vein base, and the predominantly orange-yellow tergite I+II. The species is compared with other southern African species of the subgenus, especially with *Musca xanthomelas* Wiedemann, 1824, which it resembles to some extent.

INTRODUCTION

The species recorded here was described in an unpublished thesis (Kleynhans, 1969), and has since been referred to variously as *Musca* n. sp. (Nevill, 1975), *Musca xanthomelas* s.l. (Nevill, 1979) and *Musca* sp. A. (Nevill, 1985). The species is formally described here, and is named for Dr E. M. Nevill of the Veterinary Research Institute, Onderstepoort, who has shown that the females are intermediate hosts of a filarial worm, *Parafilaria bovicola* Tubangui, 1934; this nematode causes lesions on the skins of live cattle, and on the subcutaneous surfaces of their carcases (Nevill, 1975; 1979).

Musca (Eumusca) nevilli sp. nov.

Material Examined

Holotype ♂, paratypes 25 ♂♂, 40 ♀♀ with the following data: SOUTH AFRICA: N. TVL, 15 km N of Pretoria, Farm "Kaalplaas", 28° 12′ E 25° 38′ S, E. M. Nevill, ii. 1975 (holotype ♂; paratypes 6 ♂♂, 7 ♀♀); N. TVL, 45 km N of Pretoria, Farm "Zoutpan", 28° 06′ E 25° 24′ S, E. M. Nevill, xii. 1973, i, ii. 1974 (paratypes 3 ♂♂, 24 ♀♀); N. TVL, 70 km N of Thabazimbi, Farm "Doornpan", 27° 32′ E 24° 02′ S, E. M. Nevill, i, iii. 1974 (paratypes 9 ♂♂, 1 ♀); N. TVL, Mara Research Station, 45 km W of Louis Trichardt, 29° 34′ E 23° 09′ S, E. M. Nevill, ii. 1974 (paratypes 7 ♀♀); TVL, 60 km N of Thabazimbi, Farm "Leamington", 27° 15′ E 24° 01′ S, E. M. Nevill, iii. 1974 (paratypes 5 ♂♂); E. TVL, 20 km N of Lydenburg, Farm "Mooiplaats", 30° 25′ E 24° 53′ S, E. M. Nevill, i. 1974 (paratype 1 ♀); the above specimens collected off blood-baited cattle; Transvaal, Onderstepoort, 28° 12′ E 25° 38′ S, K. P. N. Kleynhans, 1964 (paratype 1 ♂), reared from 3rd instar larva collected in cow dung; Cape Province, Herbert Dist., Salt Lake, 24° 01′ E 29° 11′ S, A. L. Dyce, i. 1974 (paratype 1 ♂), from cattle.

This type material is housed in the following 4 collections: National Collection of Insects, Plant Protection Research Institute, Pretoria—Holotype ♂, 3 ♂♂ 3 ♀♀ ex "Kaalplaas", 7 ♀♀ ex "Zoutpan", 3 ♂♂ ex "Doornpan"; British Museum (Natural History), London—3 ♂♂ 3 ♀♀ ex "Kaalplaas", 3 ♂♂ 7 ♀♀ ex "Zoutpan"; Natal Museum, Pietermaritzburg—5 ♀♀ ex "Zoutpan", 3 ♂♂ ex "Doornpan", 3 ♂♂ ex "Leamington", 5 ♀♀ ex Mara Research Station; Veterinary Research Institute, Onderstepoort Collection—1 ♀ ex "Kaalplaas", 5 ♀♀ ex "Zoutpan", 3 ♂♂ 1 ♀ ex "Doornpan", 2 ♀♀ ex Mara Research Station, 2 ♂♂ ex "Leamington", 1 ♀ ex "Mooiplaats", 1 ♂ ex Onderstepoort, 1 ♂ ex Salt Lake.

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DESCRIPTION

Male (Fig. 1, 2, 5–8, 12, 14)

Head: About 1,2 times as high as an eye; eyes subcontiguous with usual sparse, microscopic pubescence and enlarged anterior facets; frons at narrowest 0,04–0,07 width of head; frontal vitta black (reddish-brown in newly emerged specimens), very lightly dusted silvery, at narrowest about equal to diameter of anterior ocellus; parafrontalia on lower half, parafacialia and facialia, and occiput between posterior eye margins and postorbital bristles, densely and evenly silvery-white pruinose on black ground-colour; buccae, occiput, ocellar triangle and antennal fovea lightly dusted silvery; antennae black, 3rd segment with coarse golden dust, arista with 9–12 dorsal, 5–8 ventral long hairs; parafacialia about as wide as 3rd antennal segment, rarely 1,5 times as wide; postvertical bristles about as long as ocellar bristles; fronto-orbital bristles absent; parafrontal bristles 16–27 pairs, strongest toward frontal lunule; buccae, facialia setose, the latter sparsely; palps dark-brown or black, lightly dusted golden, with vertical setae long, but shorter toward apex.

Thorax (Fig. 1): Silvery-grey dusted on black ground-colour; 4 dark mesonotal vittae enclose a broad median and 2 narrower and shorter paramedian silver vittae, the latter each less than half as wide as median vitta in front of suture and containing only the hindmost presutural dorsocentral bristle; scutellum dark laterally, at base and at apex, usually with a weak median dark vitta; propleural depression bare; infra-alar bulla blackish-brown, pilose; supraspiracular convexity with long pale hairs; suprasquamal ridge with an anterior tuft of small dark bristles; prosternum with rather weak bristles; metapleuron setulose in lower posterior corner, above hind coxa; prostigma yellowish-white, poststigma brown; chaetotaxy: 2 + 4–5 dorsocentrals, the 1st 2–3 postsuturals weak; 1 prescutellar acrostichal; 1 intra-alar; 1 posthumeral; 3 humerals; 2 supra-alars, the posterior one small; 3 postalars; 2 noto-pleurals; 2 marginal, 2 discal scutellars; anterior mesopleural present; 1:2 sternopleurals; 3 propleurals; prostigmatic bristle present.

Legs: Black, with silvery dust; arrangement of bristles as follows: fore femur with *pv* row complete; fore tibia unarmed below middle; mid femur with 2 *av*, 5 *pv* in basal half, 1–2 *a* near middle, a nearly complete row of short stout *p*; mid tibia with 3–5 *p*, 2–5 *pd;* hind femur with 4 *av* in apical half, 1–2 *av* in basal half, a complete *ad* row, 1 *d*, 1 preapical *pd*, 2 *pv* in basal half; hind *tibia* with *ad* row complete and at least 1 bristle near middle strong, 1 *pd* just below middle, 1 preapical *d*.

Wings: Hyaline, with microtrichia overall; veins yellowish-brown; stem vein dorsally with a single (rarely 2) setula; base of *r4+5* setulose above and below; media

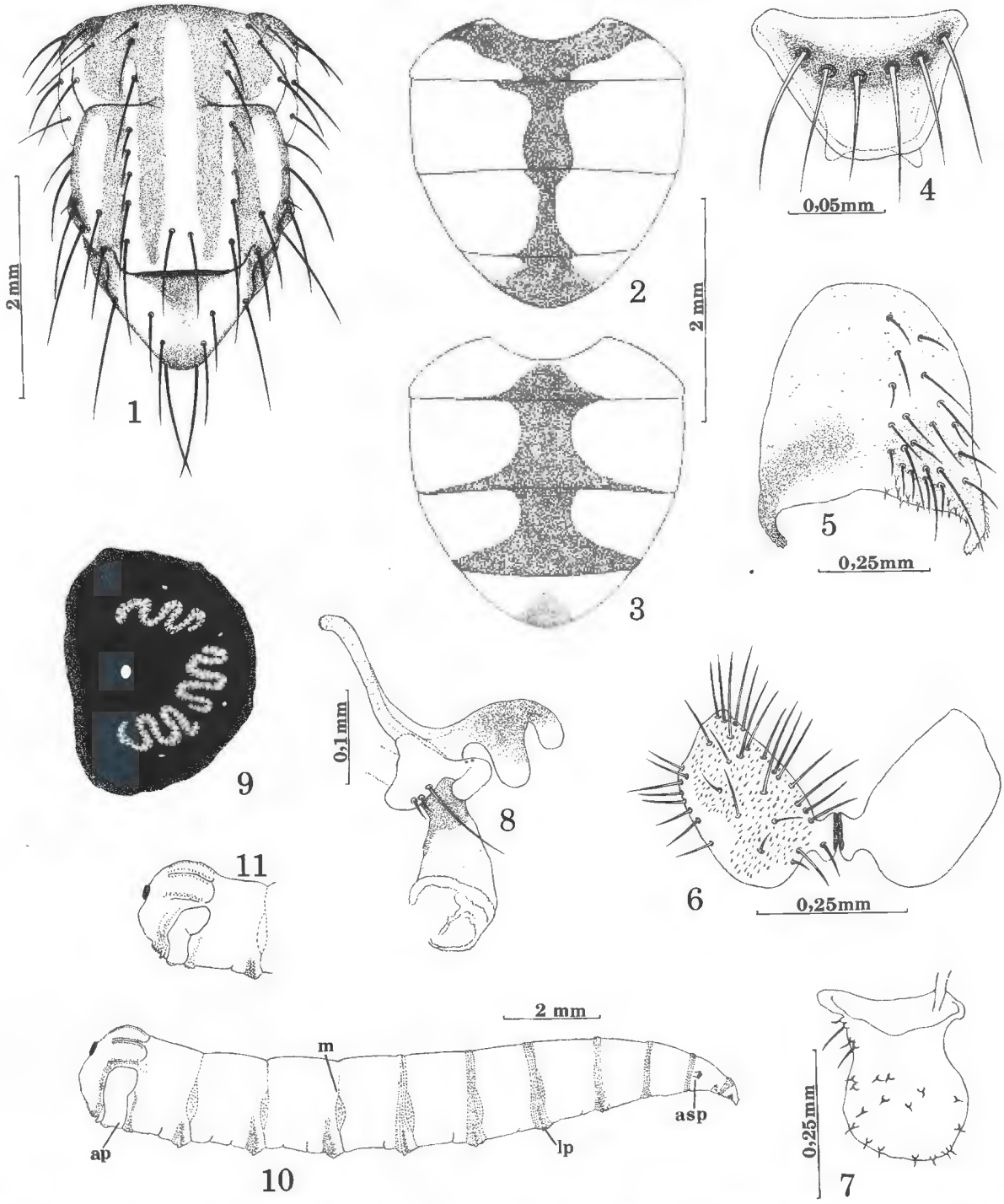

FIG. 1–10 *Musca nevilli* sp. nov. Fig. 1: Thorax, male, dorsal. Fig. 2: Abdomen, male, dorsal. Fig. 3: Abdomen, female, dorsal. Fig. 4: Supra-anal plate, female. Fig. 5: Sternite V, male. Fig. 6: Cercal plate, male, dorsal. Fig. 7: Surstylus. Fig. 8: Aedeagus with pregonite and postgonite. Fig. 9: Posterior spiracular plate, 3rd instar larva. Fig. 10: 3rd instar larva

FIG. 11 *Musca xanthomelas* Wiedemann, 1824 Posterior end, 3rd instar larva.
ap = anal plate; asp = anterior spiracle; lp = locomotor pad; m = apodemes

with a pronounced dip apically after bend; basicosta yellow; epaulet black; squamae dull white; knobs of halteres yellow.

Abdomen (Fig. 2): Predominantly orange-yellow with pale golden or golden grey dust; tergites I+II–IV each with a dark median vitta and without dark marginal bands; tergite V often extensively dark; sternite I setulose at sides, dark; sternites II–V largely yellow, sternite II with a dark basal mark, sternite V with posterolateral areas dark (Fig. 5).

Terminalia: Postgonite large, curved; pregonite with 1 strong, 2 weak setae; epiphallus very large, Y-shaped at apex; distiphallus almost as broad as long (Fig. 8, 12). Median processes of cercal plate prominent with points rounded (Fig. 6, 14). Surstylus as in Fig. 7.

Length of body 6,2–7,6 mm; length of wing 5,2–6,0 mm.

Female (Fig. 3,4)

Head: Frontal vitta black, broadest at middle and here

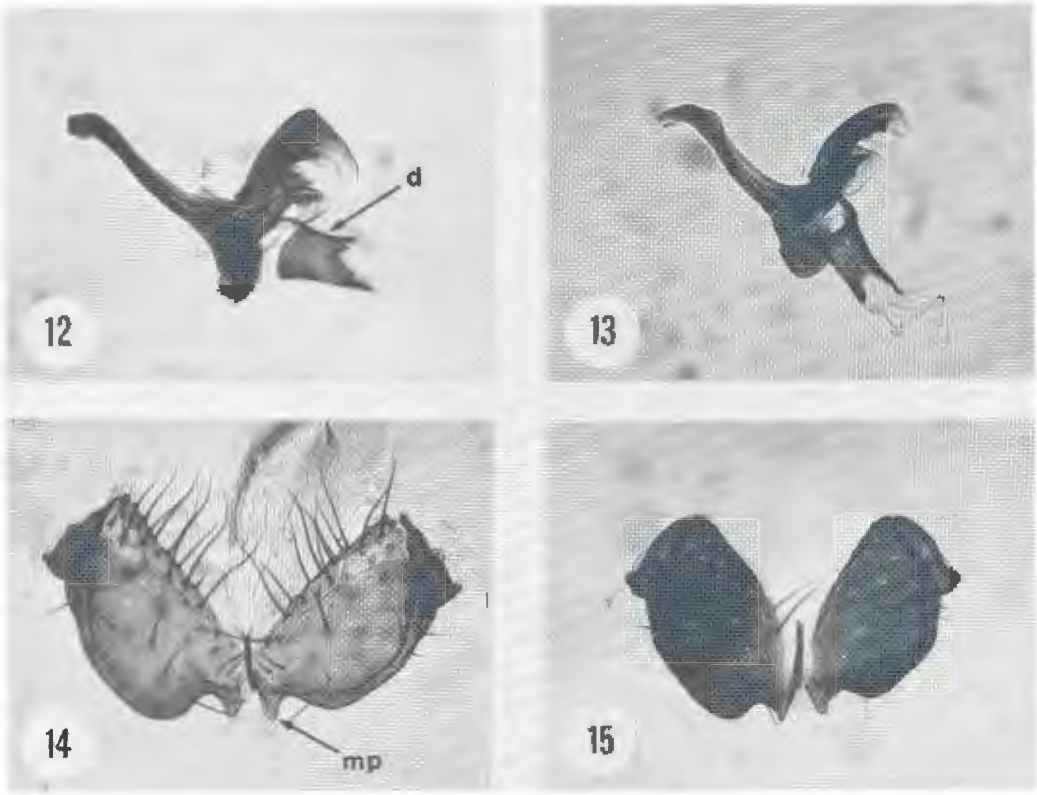

FIG. 12–15 Comparison of the aedeagi and cercal plates of *Musca nevilli* sp. nov. (Fig. 12, 14) and *Musca xanthomelas* Wiedemann, 1824 (Fig. 13, 15).
d = distiphallus; mp = median processes

0,19–0,23 and frons 0,27–0,38 width of head; parafrontalia densely silvery-white pruinose to level of ocellar triangle; parafacialia nearly twice width of 3rd antennal segment; arista with 11–12 dorsal, 7–8 ventral long hairs; postvertical bristles weaker than ocellar bristles; fronto-orbital bristles 3–4 pairs; parafrontal bristles 8–9 pairs; parafrontalia with proclinate setulae along entire length; buccae, facialia and palps as in male.

Thorax: As in male, but paramedian silver vittae widened in front of suture and broadly merged with lateral silver vittae across humeral calli. Legs and wings as in male.

Abdomen (Fig. 3): Orange-yellow and dusted as in male; tergites I+II–IV with dark median vittae, tergite V with an irregular dark terminal mark and often a weak median vitta; tergites III and IV with vittae spreading along hind margins, narrowly on III, broadly and to venter on IV; tergites IV and V with dark bands to anterior margins, but these hidden by preceding tergites; sternite I dark, setulose at sides, other sternites yellow.

Terminalia: Tergal struts of segments VI–VIII well separated; supra-anal plate with 5–6 setae (Fig. 4).

Length of body 5,1–7,3 mm; length of wing 4,3–6,4 mm.

Third instar larva (Fig. 9, 10)

A head segment (pseudocephalon) and 11 body segments are present (Fig. 10); body segments I–VII each with an anterior band of small spines, the band on segment VII often interrupted dorsally; locomotory pads on segments IV–VI with both anterior and posterior spine rows, pads on segments VII–X with posterior spine rows only; lateral oval areas enclosed by overlapped apodeme rows between segments IV–X with small spines; caudal segment dorsally with spines along the longitudinal apodeme rows; posterior spiracular plates wholly dark, and each about 1,4 times higher than wide (Fig. 9); anal plate extends to level of spiracular plates; anterior spiracles each with 7–9 digitate processes.

Length × greatest width 10,3 × 2,1–12,5 × 2,2 mm.

Puparium

Whitish with a slight yellowish tinge, brittle, effervesces in hydrochloric acid and therefore hardened by calcification (Ferrar, 1975); edge of anal plate, anterior and posterior larval spiracles, pupal respiratory horns and spines of locomotory pads brown; surface of anal plate strongly rugose.

Length × greatest width 5,9 × 2,7–6,2 × 2,9 mm.

Diagnosis

A medium-sized dung-breeding species of the subgenus *Eumusca* Townsend, 1911 with 4 dark postsutural mesonotal vittae, 1–2 bristles dorsally on the stem vein, the hairs on the ventral surface of *r4+5* confined to the vein base, and tergite I+II predominantly orange-yellow. In the male tergite IV lacks a dark marginal band, and the median processes of the cercal plate are broadly rounded. The 3rd instar larva has a complete spine band behind the anterior spiracles, small spines between the lateral overlapped apodeme rows between segments IV–X, and small spines along the longitudinal apodeme rows on the dorsal surface of the caudal segment. The puparium is white.

Relationships

M. nevilli sp. nov. belongs to the subgenus *Eumusca*, whose members are characterized by a tuft of short dark bristles at the anterior end of the otherwise bare suprasquamal ridge. The other species of the subgenus occurring in southern Africa are *Musca aethiops* Stein, 1913; *Musca munroi* Patton, 1936; *Musca xanthomelas* Wiedemann, 1824 and *Musca lusoria* Wiedemann, 1824.

In keys to the Ethiopian species of the genus by Van Emden (1939) and Zielke (1971) *M. nevilli* sp. nov.

traces to *M. xanthomelas* but tergite IV lacks a dark marginal band in the male (Fig. 2), and tergite I+II is extensively orange-yellow in both sexes (Fig. 2, 3) (the latter tergite is wholly dark in *M. xanthomelas*). The male terminalia of these 2 species differ only slightly: The distiphallus of the aedeagus of *M. nevilli* sp. nov. (Fig. 8, 12) is slightly shorter and broader than in *M. xanthomelas* (Fig. 13), and the median processes of the cercal plate are more broadly rounded (Fig. 6, 14, 15).

M. nevilli sp. nov. is smaller than *M. lusoria* and has fewer bristles dorsally on the stem vein (*M. lusoria* has 4–8 bristles). It differs from both *M. lusoria* and *M. munroi* by vein *r4+5* being haired ventrally at its base only, and to beyond *r-m* in the latter 2 species, and further from *M. munroi* by the predominantly pale tergite I+II (this tergite wholly dark in *M. munroi*). The new species differs from both *M. munroi* and *M. aethiops* in that it has 4 dark post-sutural mesonotal vittae as opposed to 2 in the latter 2 species.

In the 3rd larval instar *M. nevilli* sp. nov. (Fig. 10) differs from *M. xanthomelas* (Fig. 11) in anal plate shape and the complete spine band behind the anterior spiracles; from *M. lusoria* by the spines along the longitudinal apodeme rows dorsally on the caudal segment and the absence of spines anteriorly on the locomotory pads on segments VII–X; and from both *M. lusoria* and *M. xanthomelas* by the small spines enclosed by the lateral overlapped apodeme rows between segments IV–X.

As in *M. xanthomelas* and *M. lusoria* the puparium is white and brittle; it effervesces in hydrochloric acid, which indicates hardening by calcification rather than by tanning (Ferrar, 1975).

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