

## TAXONOMIC CHARACTERS OF FAMILY SCATOPSIDAE (DIPTERA) WITH A DESCRIPTION OF A NEW RECORD SPECIES, *Scatopse fuscipes* MEIGEN IN EGYPT

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### ABSTRACT

Family Scatopsidae represented by 104 unidentified specimens in the main reference insect collection of the Plant Protection Research Institute. Other specimens were collected recently for the present taxonomic study. The collected specimens as well as the specimens in the main collection are the source material and the first step for the identification of the species belonging to this family in Egypt. During the present study it was able to identify one species of the family which is *Scatopse fuscipes* Meigen (the subject of this study). Other specimens are still under identification. The present work include a description of the family, diagnostic characters of the subfamily Scatopsinae and genus *Scatopse* together with the description of the species *Scatopse fuscipes* Meigen. Synonyms, taxonomic notes, illustrations and distribution are included.

**Keywords:** Scatopsidae, Diptera, *Scatopse*, *fuscipes*.

### INTRODUCTION

Family Scatopsidae is a small family of rather uniform Nematocera flies. The common name is minute black scavenger flies or dung midges. Members of the family are comparatively small in size, ranging from about 1.5 mm to 4.0 mm in length and are mostly black and often shining.

Scatopsid flies despite being distributed throughout the world, they comprise a small family with only around 250 described species in 27 genera however, many await description and doubtless even more a wait discovery. Generally they are similar to black flies (Bibionidae and Simuliidae) but usually lacking the humped thorax characteristic.

Scatopsid flies are of no particular economic significance, although some species are common around mushroom houses and breweries (Freeman 1985).

Before 1912, the Scatopsidae flies were treated simply as a subfamily of the Bibionidae, as they still are in Richards and Davies (1977). 1912 was the year in which Enderlein published his revision of the group, raising it to full family rank, a condition almost universally accepted by Dipterists ever since. Edwards (1925) gave the main features separating them, showing that there are probably as many differences as similarities between the two families. Oldroyd, (1970) introduced a Handbook series, enables the two families to be separated, both from each other and from other Nematocera. The aims of this study were to describe the Taxonomic Characters Of Family Scatopsidae (Diptera) With A Description Of A New Record Species, *Scatopse Fuscipes* Meigen In Egypt

## MATERIALS AND METHODS

The adults of scatopsid flies are found in considerable numbers in flowers to take food in the form of nectar or sugar-water. They are also found crowded together in confined spaces, and may also be found on feces or on windows.

Specimens described as the source material of this study were collected from three Governorates (Giza, Asyut and Sharkiya) during autumn (September and November) by the use of the Aspirator which is the best method that used for the collection of such flies.

The collected specimens were kept dry, either double mounted on fine steel micro-pins or else attached with water-soluble glue to a card triangle.

The pinned specimens are deposited in the side collection of the reference insect collection of the Plant Protection Research Institute.

The identification of the species was based mainly on literatures that deal with the taxonomic features of the family Scatopsidae and its species.

The photos were taken by using USB Digital Microscope, but all drawings were made directly from specimens by using original Binocular Microscope.

## RESULTS AND DISCUSSION

### **Family Scatopsidae**

**Head:** in both sexes, the front of the head is rounded, or may have varying degrees of lateral compression. It is rounded behind the large compound eyes which occupy the anterior half in all but a very few species, so that they are holoptic; the eyes are setose and three ocelli are present. Antennae are short and stout with 8-12 segments, set well above the oral margin with the eyes curving round them. The antennal segments are generally wider than long, pedicellate and bearing setae. The mouth parts are short but well-formed and often large labella, the maxillary palpi are single segmented, oval or pointed, rather large and applied to the lower surface of the head, each with one or two or more sensory pits near the apex. There are no sexual differences discernible in the head.

**Thorax:** in most genera, the whole thorax is laterally compressed, the acutum being about 1.5 times as long as wide and carrying short hairs. The amount of shininess depends on the density of the microtrichia between the large bristles. Laterally, there is usually a row of supra-alar bristles. The anterior spiracle is either on the anepisternum or, in the Scatopsinae, on a separate sclerite. The postnatal phragma is strongly developed and extends well into the abdomen, usually to the second segment. **Bold wings:** All species are fully winged in both sexes. In general appearance, the wings are fairly uniform throughout the family, the anterior veins (costal and radius) dark and thickened together with the base of the media and bearing macrotrichia; The posterior veins (medial fork and cubitus) are thinner and pale, often difficult to see in slide mounted or fluid preserved specimens. The latter veins usually do not carry macrotrichia, but their occasional presence is a useful

taxonomic character. The membrane is covered with microtrichia, often densely so and with macrotrichia in addition in a few genera. The costa reaches just beyond the apex of R4+5 and terminates before the apex of the wing, frequently near the middle or basal to it; R4+5 (radial sector) is unbranched in all species; The front margin of the wing is divided for convenience into three sections as indicated. The medial vein is forked into M1 and M2 and generally connected to R4+5 by a short cross-vein r-m. Legs: The coxae are well developed, especially on the front legs where they can be as long as the femora. The femora do not have any special features. The tibiae lack apical spurs but in other species there is a long spur-like prolongation, in other species the posterior tibia is expanded apically with a dense comb-like row of setae. The tarsi in general are simple, but the basal segments are sometimes armed below with short, stout, spine-like setae; pluvilli are either very small or absent, but the empodium is well developed, pad-like and hairy.

**Abdomen:** There are seven clear pregenital segments, segments 8 and 9 forming part of the genital complex in both sexes. Tergites 1 and 2 are often divided transversely, whilst their sternites may be absent; sternite 7 and even 6 are sometimes modified as part of the genitalia. The abdominal pleura are quite characteristic for the family, being longitudinally pleated or ribbed and set with setae in a somewhat regular pattern. The tergites and sternites carry setae with microtrichia in between; The more shiny sclerites have few or no microtrichia, On dull sclerites, they are present in varying degrees of density. Sternites 6 and 7 may carry thick, short, spiniform setae in some genera. The male genitalia complex and often rotated through 180°, In most species the genitalia are capsule-like and carry one or two pairs of appendages, one pair being regarded as gonocoxites; the other, closer to the penis. As parameres or penis valves, which with the peins can be referred to as the aedeagus. The penis is usually conspicuous and may be elongate, twisted or even bifurcate in a few species.

#### **Subfamily Scatopsinae**

This subfamily contains the majority of the species and is probably the most highly evolved. The three essential features are (1) the presence of a false vein in the form of a concave fold between M2 and CuA1; (2) the condition of the sperm pump which is not closely connected to the genital capsule but only joined to the base of the penis by the fine, transparent sperm duct; (3) the placing of the anterior thoracic spiracle on a clear, separate sclerite.

#### **Tribe Scatopsini**

The main characters of all genera under this tribe are restricted by long anterior thoracic spiracular plate and by the shorter costa. Genus *Scatopse* Geoffroy, 1762 *Scatopse* Geoffroy, 1762: 544 (type species *Tipula notata* Linnaeus, 1758); Enderlein, 1912: 265; Edwards, 1925: 271; Cook, 1956: 594; 1974: 71; 1981: 318.

Head and thorax moderately compressed, head oval when seen from the front, scutum about 1.5 times as long as wide, whole body shining and devoid of microtrichia. Eyes holoptic, antennae with 10 segments, flagellar segments wider than long, palpi oval, smaller than labella, both of moderate

size. Thorax with a row of strong supra-alar setae, anterior spiracular sclerite somewhat irregular but about as long as high. Legs normal except for hind basitarsus of male which is short; front coxae about 0.75 length of femur, apical spines of posterior tibia comb-like. Wings with small, sparse microtrichia and no macrotrichia on membrane or posterior veins; wings reaching beyond end of abdomen, section 2 of costal margin nearly as long as or longer than section 3, vein M1 with spur near base, sometimes nearly reaching R4+5. abdomen with seven clear segment, 7<sup>th</sup> sternite of male emarginated and with short, conical process at centre. Male genitalia rotated through 180° and with three pairs of appendages; penis conspicuous, sperm pump rather small for size of insect but with a large reservoir.

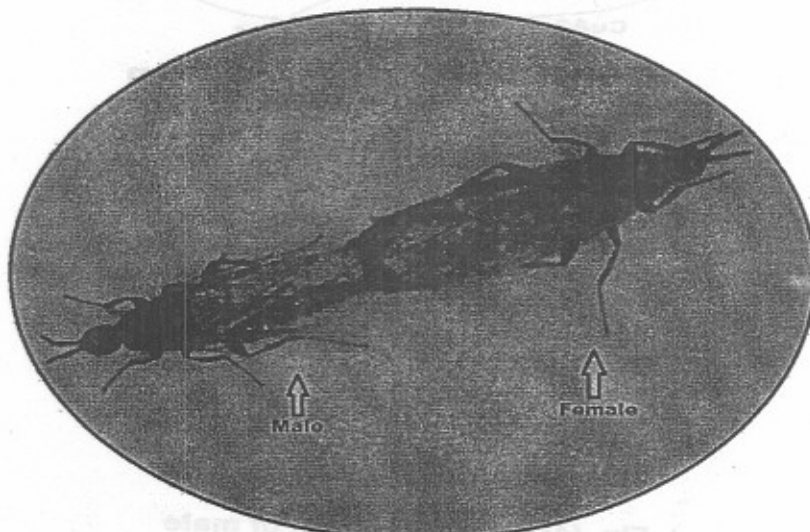
*Scatopse fuscipes* Meigen, 1830 *Scatopse fuscipes* Meigen, 1830. syst. Besch., 6: 314. *Scatopse simplex* Walker, 1848. Insecta Britannica, Diptera, 3: 144 [fide Edwards, 1925; Duda, 1928]. *Scatopse fenestralis* Skuse, 1889. Proc. Linn. Soc. N. S. Wales, (2)3: 1384. *Reichertella peruana* Enderlein, 1912. Zool. Anz., 40: 275 [fide Edwards, 1925; Duda, 1928]. *Coboldia formicarum* Melander, 1916. State Coll. Wash. Ag. Exp. Sta. Bull. 130, PP. 17-18. *Reichertella capensis* Enderlein, 1923. Stettiner Ent. Zeitg., 84: 67 [fide Duda, 1928]. *Reichertella tunesica* Enderlein, 1926. Zool. Anz., 68: 138-9 [fide Duda, 1928]. *Reichertella acuticornis* Enderlein, 1926. Zool. Anz., 68: 139-40 [fide Duda, 1928]. *Reichertella algerica* Enderlin, 1926. Zool. Anz., 68: 139 [fide Duda, 1928]. *Massatierra ferruginea* Enderlein, 1940. in Skottaberg, Nat. Hist. Juan Fernandez, 3: 666. There are new synonymies for other references see Kertész, 1902, and Duda, 1928.

The species *Scatopse fuscipes* Meigen is described as widely distributed of all Scatopsidae, as it has apparently been carried by commerce in bulb and tubers throughout the world. This species is readily recognized in the male by the medially produced seventh tergum (Fig. 4) and in the females by the single pair of contiguous processes on sternum 8 (Fig. 5). The adult are observed pairing in nature which mating takes place tail to tail (Fig. 1). The male approaches the female from behind. Bends the abdomen sideways and under to achieve coupling and then twists to point back wards the right way up. The pair can run on a flat surface, the female leading and the male running back wards.

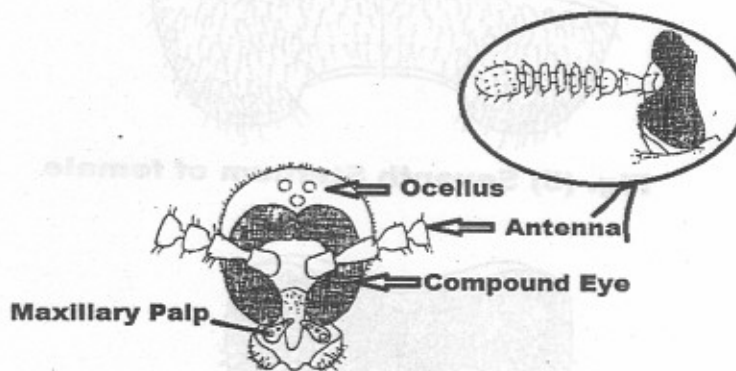
**Males:** Total length 1.34-2.14 mm. color dark grey-brown to nearly black, dull. Head (Fig. 2) jet black; antennae dull black with silvery pubescence; setae yellow or yellow-brown, except major thoracic setae black; seventh tergum of abdomen sometimes yellow or orange brown; halteres grey-brown; legs concolorous with body, except tarsi yellowish-brown, lighter than tibiae. Maxillary palpi 0.10 - 0.13 mm. long, rather slipper-shaped. Rostrum somewhat less than one-half of total head height; labellae small. Enlarged supra-alar setae 5 to 9; subspiraculars 7 to 11; pedicelars 2 to 6. spiracular sclerite large. First tarsal segment 1.75-2.60 times as long as second. Wings (Fig. 3) clear 1.3-2.07 mm. long; section 2 of costal margin 0.41-0.52 times as long as section 3; M 0.45-0.62 times as long as M2; R3 with a single, regular row of setae dorsally and a very sparse row ventrally. Segment 7 of abdomen as in (Figs. 4, 5 and 6). Tergum produced into a long process, rather variable and usually asymmetrical. A small lightly sclerotized tergum 8 located under

tergum 7 (Figs. 10 and 11). Genital vesica and apodemes 0.20-0.25 mm. long. Genitalia (Figs. 7, 8 and 9) with a single pair of appendages of uncertain homology (possibly penis valves); penis (Fig. 9) large basally, produced into an elongate spiral.

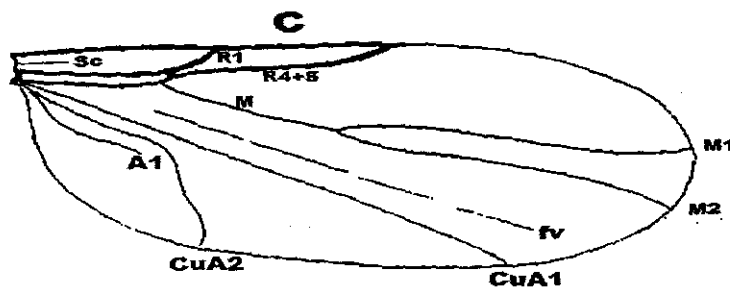
**Females:** total length 1.72-2.40 mm; wing length 1.41-1.86 mm. Supra-alar setae 5 to 9; subspiraculars 8 to 12; pedicelars 5 or 6. R3 with a single row of setae both dorsally and ventrally. Otherwise as male in color and chaetotaxy, genitalia (Figs. 10 and 11) with sternum 8 produced posteriorly into two slender, contiguous processes.



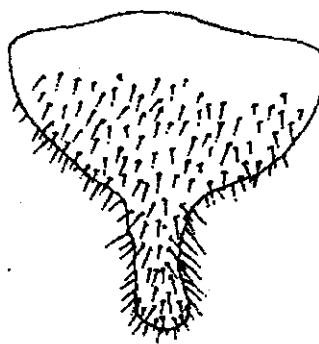
**Fig. 1) male approaches the female from behind**  
(Image tacked by Author from nature)



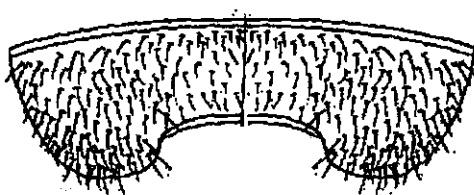
**Fig. (2) Front view of head**



**Fig. (3) Wing venation  
(fv) False vien**



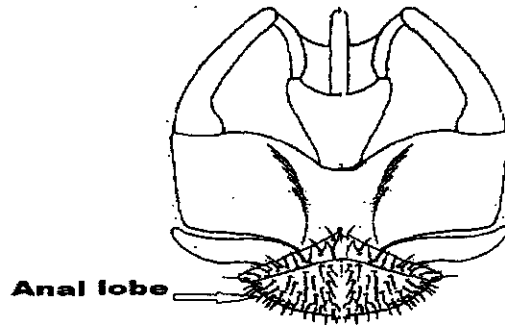
**Fig. (4) Seventh tergite of male**



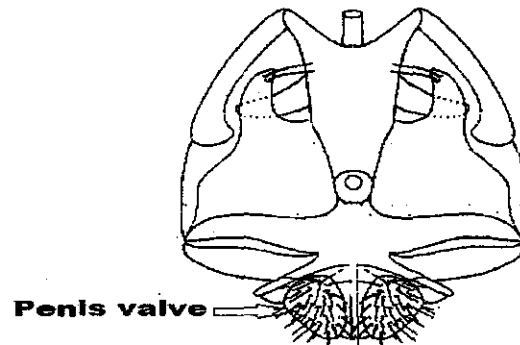
**Fig. (5) Seventh Sternum of female**



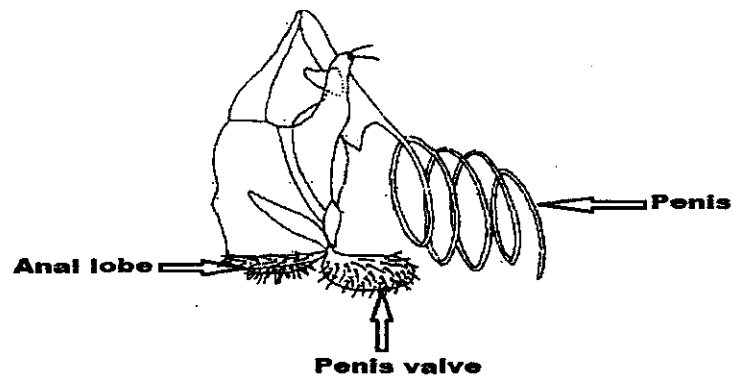
**Fig. (6) Seventh sternum segment of male**



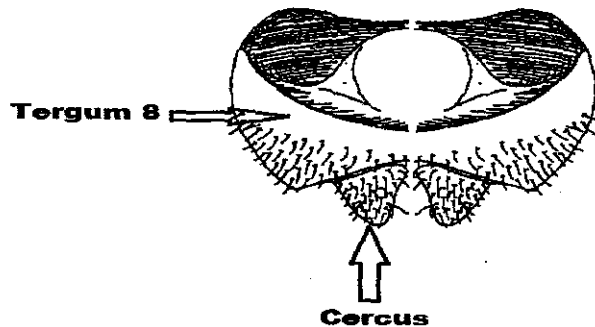
**Fig. (7) Ventral View of male genitalia**



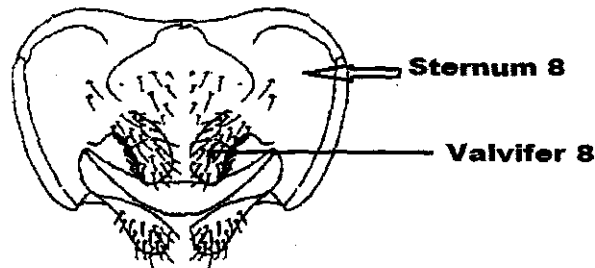
**Fig. (8) Dorsal View of male genitalia**



**Fig. (9) Lateral view of male genitalia**



**Fig. (10) Dorsal view of female genitalia**



**Fig. (11) Ventral view of female genitalia**

**Specimens examined:** Nearly 140 collected specimens of this species have been examined, that collected mainly at September, October and November from three Governorates (Giza, Assiut and Sharqiya) through 2009. In addition to 36 specimens that examined in the main collection of the Plant Protection Research Institute.

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### الصفات التصنيفية لفصيلة الاسكاتوبزیدی (رتبة ذات الجناحين) مع وصف النوع اسكاتوبز فيوسيبس الذي يسجل لأول مرة في مصر

أيمن محيى الدين ابراهيم

مركز البحوث الزراعية – معهد بحوث وقاية النباتات – قسم بحوث الحصر والتصنيف

تعتبر فصيلة الاسكاتوبزیدی التابعة لرتبة ذات الجناحين من الفصائل التي تفتقر للمادة العلمية لقلّة العلماء المهتمين بها. و يعتبر ذباب الاسكاتوبزیدی من اصغر انواع ذباب تحت رتبة النيماطوسيرا، ويتميز هذا النوع من الذباب باللون الداكن، ويتواجد في الطبيعة في تجمعات حول العائل ونادرا ما توجد فرادى بل توجد على شكل أزواج حيث يلتصق الذكر بالأنثى عن طريق البطن مما يسهل عملية الجمع، ويعتبر هذا الوضع من أهم ما يميز هذا النوع في رتبة ذات الجناحين. وتوجد بمصر ١٠٤ عينة تحت هذه الفصيلة غير معرفة و موجودة في مجموعة وزارة الزراعة الكائنة بمعهد بحوث وقاية النباتات، وقد أعطت الدراسة بشكل مفصل الوضع التصنيفي الحديث لهذه الفصيلة و صولا للنوع موضوع البحث سكاتوبس فيوسيبس حيث تم اعطاء وصف كامل للفصيلة و الصفات المميزة لتحت فصيلة سكاتوبسينى و جنس الاسكاتوبس بالإضافة الى الوصف التصلي للنوع المذكور مبينا على الشكل المورفولوجى الخارجى للحشرات الكاملة و الاجهزة التناسلية و مشتلا على المرادفات و الملاحظات التصنيفية و الرسومات الايضاحية و التوزيع الجغرافى، و كذلك تم الإشارة بأماكن تواجد هذا النوع فى الطبيعة و تم الإشارة بالفترات الزمنية التي تتواجد فيها، ويكثر هذا النوع موضوع الدراسة (سكاتوبس فيوسيبس) فى شهرى أكتوبر و نوفمبر، و لابد من الإشارة الى تواجد هذا النوع متجمعا ما يجعل تجميعه سهلا وباعداد كبيرة.

قام بتحكيم البحث

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