dominal tip. In 1 of the remaining 2 trials, no response was obtained from either extract, and in the other a single male responded to the glandless tip extract, while 4 out of 10 responded to the gland extract.

Histological slides prepared from male moths show no glandular structure at the location of the female gland, merely a normal intersegmental fold.

Extracts of female abdominal tips attract only males when exposed in orchards.⁵ Released males have been observed at dusk to fly upwind toward a pheromone source (a cotton wick impregnated with a diethyl ether extract of female abdominal tips), alight near the wick, and exhibit clasper responses in the direction of the wick.

⁵ Also reported by William Butt, Western Cooperative Spray Conference, Portland, Ore., January 13-15, 1965.

REFERENCES CITED

- Allman, S. L. 1930. Studies of the anatomy and histology of the reproductive system of the female codling moth, *Carpocapsa pomonella* (Linn.). Unpublished. California Pub. Entomol. 5: 135-64.
- Barth, R. 1937. Herkunft, Wirkung und Eigenschaft des weiblichen Sexualduftstoffes einiger Pyraliden. Zool. Jahrb. (Allg. Zool. Physiol.) 58: 297-329.
- Dickens, G. R. 1936. The scent glands of certain Phycitidae (Lepidoptera). Trans. Roy. Entomol. Soc. London 85: 331-62.
- Freiling, H. 1909. Duftorgane der weiblichen Schmetterlinge nebst Beiträgen zur Kenntnis der Sinnesorgane auf dem Schmetterlingsflügel und der Duftinsel der Männchen von *Danaus* und *Euploea*. Z. Wiss. Zool. 92: 210-90.
- Götz, B. 1951. Die Sexualduftstoffe an Lepidopteren. Experientia 7: 406-18.
- Hammad, S. H., and V. H. Jarczyk. 1958. Contributions to the biology and biochemistry of the cotton leaf-worm, *Prodenia litura* F. III. The morphology and histology of the sexual scent glands in the female moth of *Prodenia litura* (Lepidoptera: Agrotidae-Zenobienae). Bull. Soc. Entomol. Égypte 42: 253-61.
- Müller, F., as translated in G. B. Longstaff. 1912. Butterfly Hunting in Many Lands. Longmans, Green & Co., New York.
- Urbahn, E. 1913. Abdominale Duftorgane bei weiblichen Schmetterlingen. Jenaische Z. Naturwiss. 50: 277-358.

A New Species of *Metanopedias* from Great Britain (Hymenoptera: Platygasteridae)¹

D. L. JACKSON

Department of Biology, The University of Akron, Akron, Ohio

ABSTRACT

Metanopedias britannicus is described, illustrated, and compared with *M. brunneipes* (Ashmead).

Brues (1910) described the genus *Metanopedias* for the Neotropical species *Metanopedias sicarius* Brues. This species has been found to be synonymous with *Trichacis brunneipes* Ashmead 1887 (Jackson and Masner, in press). A second species, from the north of England, is described herewith.

Metanopedias britannicus new species

Fig. 1-3

FEMALE.—Length 1.5 mm. Dark brown, distal portions of legs light brown. Head transverse, slightly wider than high, twice as high as thick, slightly wider than thorax; frons shining, with very fine reticulations becoming coarser at vertex; vertex and occiput sharply separated by carina which extends to posterior corners of eyes; occiput concave, polished, without reticulations or striations; carina arising from base of projection between antennae, surrounding antennal sockets, and extending to base of mandibles; lateral ocelli their own diameter from eye margin, twice their diameter from median ocellus; antennae 9-seg-

mented, segment 3 very small, triangular, narrowest at base; segment 4 larger than any other, except scape; segment 5 small, asymmetrical; segments 6-9 large, forming poorly defined club; segments 4 and 6-9 with an unusually large number of transparent sensillae.

Prothorax elongate; with raised, saddle-shaped band anteriorly, immediately behind occiput, bearing coarse, transverse striations; anterolateral margin thickened, especially ventrally, with irregular reticulations on surface. Mesopleura and lateral areas of pronotum smooth, bare, shining. Mesoscutum with faint, but completely parapsidal furrows, converging only slightly posteriorly; area between furrows slightly elevated, extending posteriorly over base of scutellum as a thin, translucent, truncate plate; smooth, shining, bare except for a row of rufous hairs at posterior margin which extends over base of scutellum on each side of median plate. Scutellum, seen from side, level with mesoscutum; covered laterally with long, rufous hairs, median area almost bare; extending posteriorly as a convex plate (in the same manner as median area of mesoscutum), obscuring propodeum from above; propodeal lamellae low, close together. Metapleura

¹ Accepted for publication April 1, 1966. Cost of printing was met by the author.

FIG. 1-3.—*Metanopedias britannicus*, new species, female. 1, dorsal view. 2, head and thorax, lateral view. 3, antenna.

entirely covered with long, white hairs. Wings colorless, veinless. Fore-wing with fringes of medium length apically, becoming abruptly short on hind margin; entire surface evenly covered with microtrichia. Hind wing with longest fringes one-third of width of wing at widest point; fringe hairs much shorter and more numerous opposite hamuli than at any other point on posterior margin; basal third of wing surface bare.

Gaster as long as head and thorax combined, slightly narrower than thorax, moderately flattened anteriorly, becoming narrower and spatulate posteriorly. Petiole broad, bare dorsally, with raised median area bordered by 2 longitudinal carinae; ventral surface completely covered by long, white hairs. Segment 2: tergite bare, shining, with shallow lateral foveae at base bearing longitudinal striations which extend halfway along the sclerite; sternite with deep basal foveae extending more than half the length of the sclerite and filled with white hairs anteriorly; with

a small patch of fine hair at mid-length of sclerite close to each laterotergite. The remaining segments entirely bare, shining. Segment 3 triangular, much flattened posteriorly. Segment 4 spatulate, lateral margins parallel; sternite transparent posteriorly, where it extends past the tergite. Segment 5 short, triangular. The ovipositor can be seen through the semi-translucent, spatulate segments.

MALE.—Unknown.

Holotype: ♀, Dipton, County Durham, England, June, 1958, D. L. Jackson. No. 68968 USNM. Antenna on slide with same data and number.

DISCUSSION

Brues (1910) defined the genus *Metanopedias* as possessing 9-segmented antennae. A re-examination of the holotype of *M. sicarius* has shown that the antennae are 10-segmented, segments 3 and 4 being ex-

tremely small and the latter very closely associated with segment 5. In *M. britannicus* the loss or fusion of the fourth segment has occurred and the antennae are 9-segmented. The female of *M. britannicus* also differs from that of *M. sicarius* by possessing an additional gastral segment. Although intrageneric variation in the number of antennal or gastral segments (in the same sex) is very unusual in the Platygasteridae, these 2 species are undoubtedly closely related. The generic definition must therefore be modified as follows: Antennae in female either 9-segmented, segment 3 very small, or 10-segmented, segments 3 and 4 very small, the latter closely associated with segment 5; abdomen in female 4- or 5-segmented.

Females of the 2 species of *Metanopiedias* can be distinguished by the following characters:

<i>M. brunneipes</i>	<i>M. britannicus</i>
Occiput with coarse striations	Occiput smooth, polished
Antennae 10-segmented	Antennae 9-segmented
Parapsidal furrows well developed	Parapsidal furrows faint
Gaster 4-segmented, segment 3 transverse, 4 elongate, bluntly triangular	Gaster 5-segmented, segment 3 elongate, triangular, 4 and 5 short the latter triangular

REFERENCES CITED

- Brues, C. T. 1910. Some parasitic Hymenoptera from Vera Cruz, Mexico. Bull. Amer. Mus. Nat. Hist. 28(8): 79-85.
- Jackson, D. L., and L. Masner. In press. A redescription of *Metanopiedias brunneipes* (Ashmead), new combination, with notes on its geographical distribution and host relationships. Can. Entomol.

External Genitalia of Meloidae (Coleoptera). I. The Genitalia and Their Musculature in *Lytta vulnerata*¹

A. P. GUPTA²

Department of Entomology and Economic Zoology
Rutgers—The State University, New Brunswick, New Jersey

ABSTRACT

The external genitalia and their musculature in both sexes of *Lytta vulnerata* (LeConte) are described, illustrated, and discussed, with comments on other authors' interpretations of various genitalic components and associated structures.

Interspecific variation noted in several components of the genitalia suggests that they may be useful in taxonomic studies of the Meloidae.

In a previous study of the internal anatomy of Meloidae (Gupta 1965), the writer showed that some of the internal reproductive organs have taxonomic significance. Although some taxonomists have very briefly mentioned the external genitalia of certain taxa in this family, there has been no detailed, comparative, morphological study of them and their taxonomic significance. This is especially true of the female genitalia, as was remarked by Tanner (1927) and Enns (1956). A review of the literature revealed also a lack of uniformity in the terminology of some components of the genitalic complex. The writer, therefore, proposes to describe the external genitalia in the Meloidae and discuss their taxonomic significance in a series of papers. The present description of the genitalia in *Lytta vulnerata* (LeConte) will form the basis of the following papers in this series.

Although several authors (Stein 1847; Lacaze-Duthier 1853; Verhoeff 1893a, 1893b; Escherich 1894; Tanner 1927; Heberday 1928, 1931; Metcalfe 1932; Jeannel and Paulian 1944; and Wood 1952, among others) have studied the external genitalia in several families of Coleoptera, they have either com-

pletely omitted the family Meloidae or have confined their studies to only a single species. Sharp and Muir (1912), however, briefly described the male genitalia in *Tegrodera erosa* LeConte, *Horia* (Cissites) deb. Fairmaire, and *Nemognatha* sp. Some of the taxonomists who have briefly mentioned external genitalia in various taxa within the family are Dillon (1952), Selander (1955, 1960, 1964), Enns (1956), Par. Alcaide (1958), and Kaszab (1962). Beaugregan (1890) was perhaps the first to describe the genitalia in detail, as well as several other organ systems in the Meloidae, but his work needs revision and reinterpretation.

MATERIALS AND METHODS

For study of the genitalia, the abdomen was boiled in 10% KOH for 20 min, washed in water, passed through 70% alcohol, and cleared in creosote. For the study of the genitalic muscles, specimens previously preserved in 10% formaldehyde were dissected in 70% alcohol. All drawings were made with ocular grid, and are not to the same scale.

FEMALE GENITALIA AND ASSOCIATED STRUCTURES

The principal components of the female genitalia are a pair of *valvifers* (VA, Fig. 1, 3, 6, 9), which are confined to segment 9. There is no indication of valvulae (gonapophyses). A distinct ovipositor is

¹ Paper of the Journal Series, Agricultural Experiment Station, Rutgers—The State University, New Brunswick, N. J. Accepted for publication August 11, 1965.

² The author affectionately dedicates this paper to Professor William F. Barr of the University of Idaho, in recognition of his many-sided interests in Coleopterology.