

A CONTRIBUTION TO OUR KNOWLEDGE OF HIGH ALTITUDE
SYRPHIDAE (CYCLORRHAPHA:DIPTERA) FROM N. W. HIMALAYA

PART I—SUBFAMILY SYRPHINAE*

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INTRODUCTION

Ever since the publication of Brunetti's Diptera volume, in the "Fauna of British India" series in 1923, the systematics of Indian Syrphidae commonly known as "hoverflies", have been completely neglected. In the meanwhile, some revolutionary changes have taken place in the concept of insect taxonomy, which has assumed a more dynamic character than in the past. With a view to bring the knowledge of Indian Syrphidae up-to-date, a comprehensive programme of taxonomic studies has been launched. The present paper represents the first in the series and contains the descriptions of five species new to science, in addition to fresh records of zoogeographical distribution. The study is based on the small but interesting collections made from high altitudes of N. W. Himalayas.

I am grateful to Dr. T. Singh, Professor of Zoology and Entomology, School of Entomology, St. John's College, Agra, for facilities for work and encouragement. I am also thankful to Dr. Santokh Singh, Leader of Fourth Entomological Expedition to N. W. Himalayas, for placing the small but unique collection of insects at my disposal. My thanks are due to C. S. I. R. for the award of Senior Research Fellowship that enabled me to pay my full time attention to this work.

The type specimens of new species, retained temporarily in the School of Entomology Collection, will be deposited in the Zoological Survey of India, Calcutta.

SYRPHUS HIMALAYANUS, sp. nov.

♂ *Head*: Eyes dark-grey and bare; ocellar triangle shining black, with minute pubescence. Frons comparatively small at the vertex, gradually widening anteriorly and about one-third the height of the eye at antennal bases; prefrons blackish with black pubescence; antennal prominence pubescent and brownish-yellow; the post-frons with golden yellow pubescence; jowls and occiput distinctly black; occipital margin grey with whitish pubescence. Antennae and arista brownish-yellow; third antennal segment oval, about one and a half times as long as wide; arista minutely pubescent.

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Thorax : Shining black with dense light yellow pubescence, pleurae black; scutellum dark yellow; darker adjoining the scutum with microscopic whitish pubescence.

Legs : Pale yellow clothed with yellow pile; coxae black.

Wings : Hyaline; stigma yellowish; halteres brownish-yellow.

Abdomen : (Fig. 1) First abdominal segment shining black; second black with large, oval yellow spots; third and fourth segments with broad yellow bands running along the anterior margin; last segment with a yellow, posterior border; pubescence light yellow.

Holotype : ♂ on pin, India: Manali, three and a half miles from Post Office in the Monasu Gorge, 2134-2438 m. N. W. Himalaya, 24.5.1961, coll. S. K. Tandon, Fourth Entomological Expedition from the School of Entomology, St. John's College Agra, 1961.

This species runs close to *Syrphus latifasciatus* Macq., from which it is distinguished by the scutellum with small white bristles; hind femora yellow and facial bump yellow with a dark tinge.

SYRPHUS AEQUALIS Walker

1852. *Xylota aequalis*, Walker, *Ins. Saund.*, Dipt. i, p. 226.

1915. *Syrphus distinctus*, Brunetti, *Rec. Indian Mus.*, xi p. 211, pl. viii, fig. 7.

1923. *Syrphus aequalis*, Brunetti, *F. Brit. India*, 3 : 90.

The species is earlier described from three males in the Indian Museum from Tolpani, Garhwal District, West Himalaya, 2896 m. To this I add the description of a female for the first time.

Head : Face yellowish-brown with a median black stripe; cheeks dark-grey; the oral margin as prominent as the antennal base, frons with black bristles; vertex black, setaceous. Antennae and arista dark; third antennal segment about twice as long as wide, arista bare.

Thorax : Dorsum and pleurae black, brownish-yellow pubescence, thicker laterally than dorsally. Scutellum orange-yellow, black bristles in the middle and yellowish, long bristles on the lateral and hind margins.

Legs : Anterior and middle legs orange-yellow, setaceous, femora black basally, the hind leg dark-grey with dark bristles.

Wing : Hyaline, tinged with grey, stigma dark brown, squamae yellowish with yellow pile.

Abdomen : (Fig. 2) Blackish; first segment short, black; second segment black with a pair of broad, triangular, yellow spots, lateral margins promi-

nently setaceous; third and fourth segments black with broad, yellow transverse bands across the middle of the former and the anterior margin of the latter, transverse bands clothed with minute, yellow pubescence while the lateral margins bearing small dark pubescence; posterior margins of the fourth and fifth segments light yellow with whitish pubescence.

Length: Body 7.75 mm, Wing 6.25 mm.

Allotype: One female on pin., labelled "India: Kalatop Forest Rest House (7 miles from Dalhausie), 8,000 ft., 30.9.1962, coll. J. L. Nayar."

SYRPHUS ASSIMILIS Macquart

1846. *Syrphus assimilis*, Macquart, *Dipt. Exot.*, Suppl., 1 : 135.

1923. *Syrphus assimilis*, Brunetti, *F. Brit. India*, 3 : 94.

I have before me a male labelled "India : Kalatop Forest area, 2440 m. 25.9.1962, coll. J. L. Nayar."

The specimen examined differs from the published description of the species in the following respects:—Central bump darkish-yellow, third antennal segment tawny basally and dark apically. Scutellum darkish adjoining the mesonotum and yellowish marginally, wings lightly darkish, subcostal cell brownish.

This species is previously known from India, but no specific locality is mentioned. The present collection is apparently the first record of its occurrence in N. W. Himalaya.

Syrphus balteatus De Geer

1763. *Musca canabina*, Scopoli, *Ent. Carn.*, p. 334.

1776. *Musca balteata*, De Geer, *Mem. Insectes*, vi, p. 116.

1776. *Musca Scitulus*, Harris, *Expos. Engl. Ins.*, p. 105.

1776. *Musca scitulus*, Scitule, *Expos. Engl. Ins.*, p. 111.

1781. *Musca alternatus*, Schrank, *Enum. Ins.*, p. 448.

1787. *Musca nectareus*, Fabricius, *Mant. Ins.*, 2 : 341.

1824. *Syrphus viridaureus*, Wiedemann, *Anal. Ent.* p. 35.

1830. *Syrphus nectarinus*, Wiedemann, *Auss. Zweifl.*, 2 : 128.

1842. *Syrphus alternans*, Macquart, *Dipt. Expt.*, 2 (2) : 89.

1856. *Syrphus triligatus*, Walker, *Proc. Linn. Soc. London*, 1 : 19.

1908. *Syrphus balteatus*, de Meijere, *Tijd. v. Ent.* li, p. 297.

1923. *Syrphus balteatus*, Brunetti, *F. Brit. India*, 3 : 82.

Material examined: "India : Dalhausie-Khajjair Road, 2038-2129 m.

1 ♂, 1 ♀, 28.9.1962, coll. J. L. Nayar; Kalatop, 2440 m. 1 ♂, 25.9.1962,

coll. (Miss) Sneh Gupta, 1, 29.9.1962, coll. (Miss) Sneh Gupta, Narkanda 60 km. away from Simla on the Hindustan-Tibet Road, 9,560 ft., many in spirit, coll. J. L. Nayar."

The present collection from the foothills of Himalaya differs from the plain form in having the deeply black abdominal bands.

SYRPHUS CONFRATER Wiedemann

- 1830. *Syrphus confrater*, Wiedemann, *Auss. Zweifl.*, 2 : 120.
- 1852. *Syrphus craprapes*, Walker, *Ins. Sound. Dipt.*, pt. 3, p. 231.
- 1852. *Syrphus mundus*, Walker, *Op. Cit.*, p. 230.
- 1884. *Syrphus tritimbatus*, Bigot, *Ann. Soc. Ent.*, France, 6 (6) iv, p. 86.
- 1923. *Syrphus confrater*, Brunetti, *F. Brit. India*, 3 : 92.

To this species I refer a female labelled "India : Kalatop-Lakkar Mandi bridal path (about 7 miles from Dalhausie), 2280-2440 m. 29.9.1962, coll. J. L. Nayar."

The specimen before me differs from the published description in the ocellar triangle being metallic-blue, bare, with pinkish ocelli, scutellum with light yellowish pubescence; abdomen with incomplete yellow band on the second abdominal segment and a complete band in the anterior half of the third abdominal segment.

This species is reported from India; Sumatra; Indonesia; New Guinea; China; Japan and Ceylon.

SYRPHUS COROLLAE Fabricius

- 1794. *Scaeva corollae*, Fabricius, *Ent. Syst.*, 10 : 306.
- 1822. *Syrphus corollae*, Meigen, *Syst. Besch.*, 3 : 304.
- 1862. *Syrphus corollae*, Schiner, *Fauna Austr.*, 1 : 306.
- 1901. *Syrphus corollae*, Verrall, *Brit. Flies*, 8 : 381.
- 1923. *Syrphus corollae*, Brunetti, *F. Brit. India*, 3 : 85.

To this species I refer a female labelled "India : Manali, about 5.6 km. from Post Office in the Manalsu Gorge, 2129-2440 m. 24.5.1961, coll. Santosh K. Tandon."

This widely distributed species is earlier known from Europe; Madeira; Canaries; N. Africa and Asia to Japan. No information is available regarding its distribution in the elevated parts of N. W. Himalaya and the present record extends its altitudinal distribution.

SYRPHUS GRISEOCINCTUS Brunetti

- 1923. *Syrphus griseocinctus*, Brunetti, *F. Brit. India*, 3 : 77.

To this species I refer a male labelled, "India : North-West of Kalatop Forest Rest House, 2440 m. coll. J. L. Nayar,"

The specimen before me differs from the earlier description in the following points : Facial bump dark-brown with small, black pubescence; halteres dark with a terminal yellow spot and abdominal bands yellow.

The species is previously known from Bogerkote, Kumaon. W. Himalaya, 2440 m. 29.10.1914. The present record extends its distribution further into the N. W. Himalayas.

SYRPHUS LATIFASCIATUS Macquart

- 1834. *Syrphus latifasciatus*, Macquart, *Hist. Nat. Dipt.*, 1 : 541.
- 1840. *Syrphus affinis*, Loew, *Prog. Posen etc.*, p. 35.
- 1848. *Syrphus latifasciatus*, Macquart, *Rec. Soc. Sci. Lille*, p. 242.
- 1849. *Scaeva abbreviatus*, Zetterstedt, 8 : 3136.
- 1857. *Syrphus flaviceps*, Rondani, *Dipt. Ital. Proc.*, 2 : 133.
- 1862. *Syrphus excisus*, var., Schiner, *Faun. Austr.*, 1 : 311.
- 1863. *Syrphus affinis*, Palma *Ann. Accad. Aspir. Nature Napoli*. 3(3) : 51.
- 1901. *Syrphus latifasciatus*, Verrall, *Brit. Plies*, 8 : 371.
- 1923. *Syrphus latifasciatus*, Brunetti, *F. Brit. India*, 3 : 87.

To this species I refer a female labelled. "India : North-West of Kalatop Forest Rest House, 2440 m. 30.9.1962, coll. J. L. Nayar."

This is one of the important polytypic species, which extends up to N. America. In India it is only known from Simla, 2440 m.

The only difference from the earlier description of the species is the presence of black pubescence along the lateral margins of the scutellum.

SYRPHUS MACULIPLEURA Brunetti

- 1913. *Syrphus maculipleura*, Brunetti, *Rec. Indian Mus.*, 8 : 162.
- 1923. *Syrphus maculipleura*, Brunetti, *F. Brit. India*, 3 : 92.

To this I refer a female labelled "India : Manali, 5.6 km. from Post Office in the Manalsu Gorge, 2129-2440 m. N. W. Himalaya. 24.5.1961, coll. S. K. Tandon."

The species is previously recorded from Rohtung (Assam) and seems to represent Indo-Malayan element in the Indian fauna. The present collection extends its distribution north-westwards almost up to southern fringe of Southern Palaearctic.

SPHAEROPHORIA VIRIDAENEA Brunetti

- 1915. *Sphaerophoria viridaenea*, Brunetti, *Rec. Indian Mus.*, 11 : 216.
- 1923. *Sphaerophoria viridaenea*, Brunetti, *F. Brit. India*, 3 : 101.

To this species I refer a female labelled, "India : Kalatop (11.2 km. Dalhausie), 2440 m., 25.9.1962, coll. J. L. Nayar."

The specimen before me differs from the earlier description in the presence of scutellum being black, stigma off-white and halteres deep yellow.

The species is earlier reported from Darjiling and Simla. The present record extends its distribution into the N. W. Himalaya.

MELANOSTOMA UNIVITTATUM Wiedemann

1824. *Syrphus univittatus*, Wiedemann, *Analecs Entom.*, p. 36.
 1830. *Syrphus univittatus*, Wiedemann, *Auss. Zweifl.*, 2 : 139.
 1848. *Syrphus planifacies*, Macquart, *Dipt. Exot.*, Supp. 3 : 43.
 1857. *Syrphus cyathiger*, Walker, *Proc. Linn. Soc. London*, 1 : 125.
 1884. *Syrphus cyathiger*, Bigot, *Ann. Soc. Ent.*, France (6) iv, 7 : 86.
 1908. *Melanostoma planifacies*, de Meijere, *Tijd. v. Ent.*, 51 : 313, 54:346, (1911).
 1915. *Melanostoma univittatum*, Brunetti, *Rec. Indian Mus.*, 11 : 208.
 1923. *Melanostoma univittatum*, Brunetti, *F. Brit. India*, 3 : 50.

To this species I refer a male labelled, "India : Dalhausie—Khajjair Road, 2038-2129 m. 28.9.1962, coll. J. L. Nayar."

The species is earlier recorded from Darjiling, Bhimtal, Pusa, Chapra, Goromandal, Nedumangad, Sadiya, Shillong, Dibrugarh; Singapore; Ceylon; Sumatra, Queensland and Nepal. It is a widely distributed species in Indian plains and the present record extends its range to the foothills of N.W. Himalaya.

RHINGIA SIWALIKONSIS sp. nov.

Head: Frons and snout brownish-yellow; ocellar triangle dull black, bare with ocelli pinkish. Frons about one-fourth the width of the head, minutely pubescent. Cheeks grayish-black, pubescence white; occiput black; eyes pubescent, dark-brown. Antennal pubescence shining black, covered with extremely soft white pubescence; antennae brownish-yellow; third antennal segment oval, about as long as wide, basal half deep brownish; arista tawny, long and pubescent.

Thorax: Black without any longitudinal stripes, golden yellow pubescence, hypopleuron and sternopleuron aeneous clothed with light yellow tomentum, pteropleuron with numerous shining, long, soft, fuscous bristles. Scutellum concolorous with the mesonotum for about two-thirds of its length, posteriorly light grayish-black, sparsely covered with light yellow pubescence in the aeneous portion; marginal setae long and yellow; posterior bristles black, long, strong and accompanied with yellow pile.

Legs: Dark-brown with yellow pile, basal two-thirds of the femora black; mid femur yellowish, prominently setaceous; claws tawny.

Wings: Hyaline, stigma and basal cells dusted light yellow; halteres prominent, stalk brownish-yellow and the knob dark-brown.

Abdomen: (Fig. 5) Brownish-yellow; first and second abdominal segments covered with thick, yellow pile; in addition to small, yellow setae; posterior segments with long, deep golden yellow tomentum. First abdominal segment with a narrow black band on the posterior border; second and third abdo-

minal segments with a broad black band on the posterior border; a longitudinal median, black stripe connecting the transverse bands; longitudinal stripe wider on the second segment than the third abdominal segment.

Length : Body 9.00 mm, Wing 7.50 mm.

Holotype: One male on pin, "India : Kalatop 11.2 km. from Dalhausie 2440 m. N. W. Himalaya; 25.9.1962. coll. J. L. Nayar."

Paratype: One male with the same data as holotype.

The species comes near to *Rhingia laticincta* Brunetti from India : Darjiling, but can easily be separated by the second, third and fourth abdominal segments being brownish-yellow, presence of a continuous longitudinal, black median stripe on the second and third abdominal segments with colour variation and differences in size of the thorax.

RHINGIA LATICINCTA Brunetti

1908. *Rhingia laticincta*, Brunetti, *Rec. Indian Mus.*, 2 : 58.

1923. *Rhingia laticincta*, Brunetti, *F. Brit. India*, 3 : 132.

I have before me one female and a male labelled "India : Dalhausie—Khajjair Road, 2038-2129 m. 29.9.1962. coll. J. L. Nayar."

The species is earlier recorded from Darjiling, Mussoorie and Simla.

RHINGIA LATICINCTA var. FASCIATA Brunetti.

1908. *Rhingia laticincta* var. *fasciata*, Brunetti, *Rec. Indian Mus.*, 2 : 58.

1923. *Rhingia laticincta* var. *fasciata*, Brunetti, *F. Brit. India*, 3 : 133.

To this I refer a specimen labelled "India : Kalatop, 2440 m. 28.9.1962, coll. (Miss) A. Walters."

This variety is earlier reported from Darjiling. Present record extends its distribution into N. W. Himalaya.

DIDEOIDES ANNANDALEI Brunetti

1919. *Didea annandalei*, Brunetti, *Rec. Indian Mus.*, 21 : 299.

1923. *Dideoides annandalei*, Brunetti, *F. Brit. India*, 3 : 58.

To this I refer a female labelled "India : Narkanda, 67 km. on Hindustan-Tibet Road from Simla. 22.9.1962. coll. J. L. Nayar."

The specimen before me differs from the published description of the male in the following respects : Frons brownish-yellow below the antennal bases with minute golden-yellow pile; vertex and upper part of the frons up to about one-fourth the total length of the eye, dark, setaceous, antennae blackish and wings with third longitudinal vein well dipped.

The species is earlier reported from Nasratabad (Seistan). The species is recorded for the first time from India, and its occurrence in the N. W. Himalaya along with Seistan, suggests its Ethiopian affinities.

DIDEA FASCIATA Macquart

1834 *Didea fasciata*, Macquart, *Hist. Nat. Dipt.*, 1:508.

1923 *Didea fasciata*, Macquart, *F. Brit. India*, 3:56.

To this I refer a series of males and females labelled, "India: Dalhausie-Khajjair Road, 2038 m. coll. J. L. Nayar."

The specimens differ from the published description in the presence of black stripe on the frons.

The species is already known from Shillong (India), Central and South Europe; Japan and North America. This Holarctic species seems to be restricted in India to the elevated Himalaya.

BACCHA TRIBENI, sp. nov.

♂ *Head*: Frons covered by small black bristles above the antennae; yellowish with a black tinge; face below antennae tawny with a median brownish stripe; microscopic yellow pubescence on the entire face with a few prominent marginal whitish setae. Frontal lunule semi-circular, black, bare, cheeks grayish-yellow with yellow pubescence; eyes bare, contiguous almost to the vertex; vertex small, blackish with white pubescence; ocelli pinkish-gray.

Thorax: Shining black with a yellow tinge; pleurae grayish-black; mesonotum with thinly yellow pubescence; notopleural areas thickly clothed with golden yellow, long, soft bristles; scutellum dirty yellow with a gray tinge basally and dorsum with distinct black setae.

Legs: Fore and midlegs entirely brownish-yellow, covered by yellowish pubescence; hind coxa and upper half of the femur yellowish with long yellow pile; hind tibia, and tarsus black with minute white pubescence.

Wings: Dusted brown; stigma strongly tinged brown, much elongated; halteres, small with stalk and knob yellowish-brown.

Abdomen: (Fig. 3) Yellowish-brown; covered with minute black pile; lateral margins setaceous. First segment brownish; second segment pedicellate with a median inverted Y-shaped black marking; third segment narrow basally, moderately widening posteriorly with a wide black cross marks; fourth segment deep brown at the base, blackish posteriorly and laterally; fifth segment blackish-brown, black pubescence dorsally.

Length: Body 10.25 mm, wing: 9.50 mm.

Holotype: One male on pin. "India: Narkanda (67 km. on the Hindustan-Tibet Road, from Simla), 2743 m. 22. 9. 1960, coll. Tribeni Singh."

The species comes near to *Baccha fallax* Austen but can readily be separated by the wing base being brownish; brownish stripe on the face; thorax shining black; scutellum dirty yellowish and abdominal black markings.

CHILOSIA KALATOPENSIS sp. nov.

Head: Frons and vertex shining blackish blue; frons widening gradually from vertex to the antennal bases, about one-third the width of the head above the antennae, central knob, shining blue giving the appearance of an elongated transverse callus, frons dusted with white pubescence. Ocellar triangle concolorous with the vertex, bare ocelli, pinkish. Cheeks dark-gray with shining white pubescence; occipital margin metallic-blue with minute white fringe. Antennae dark-blue; third antennal segment about two times as long as wide; arista shining black, bare.

Thorax: Shining blackish-blue; hypopleuron, sternopleuron and pteropleuron grayish-blue; pubescence of thorax white; scutellum concolorous with the mesoscutum, and with shining white pubescence on the margins and posterior border.

Legs: Coxae black, foreleg trochanter a little brownish towards the femoral joint; femora black except with brownish distal ends, tibia brownish-black; mid and hind tarsi black; fore tarsus brownish-black, pubescence whitish on the black parts.

Wings: Hyaline; stigma dusted light brown; halteres, distinct, stalk and capitellum brownish.

Abdomen: Black with a bluish tinge microscopically pubescent dorsally, marginal pubescence long, soft whitish on the first and second abdominal segment.

Length: Body 6.25 mm, wing 6.75 mm.

Holotype: One female on pin. "India: Kalatop-Lakkarmardi bridal path, 2440 m. 29.9.1962, coll. J. L. Nayar."

The species comes near to *Chilosia hirticincta* Brun. from Darjiling but can be easily separated by the whitish pubescence on the abdomen and various other differences in the distribution of coloured spots.

XANTHOGRAMMA INDICA, sp. nov.

Female Head: Frons light yellow with a grayish-brown median stripe below the antennal bases; parafrontals light yellow; frontalia grayish-yellow; a small space above the antennal bases brownish-yellow; vertex and ocellar triangle shining blue, bare; ocelli pinkish; cheeks dark-yellow ventrally with shining yellow pubescence, eyes reddish with white pubescence. Antennae dark brown; third antennal segment about two and a half times as long as wide; arista brown, bare. Occipital margin deep gray with white fringe.

Thorax: Shining blue, without longitudinal stripes on the dorsum, lateral margins narrowly light yellow from humeri to scutellum; hypopleuron sternopleuron and pteropleuron dull blue; dorsally thoracic pubescence, microscopic and white; lateral margins prominently setaceous; pleurae with tufts of white bristles. Scutellum light yellow, shining dark medially, with minute pubescence; lateral and posterior margins with prominent whitish pubescence.

Legs: Brownish-yellow, delicately pubescent; legs with apical halves of the femur black; hind femur apical two-thirds, black, with a few long, soft hair on the black portions.

Wings: Hyaline; stigma dusted off-white; halteres prominent, stalk and knob brownish.

Abdomen: (Fig. 4) Black; white, long, thick shining white pubescence on the second, third and fourth abdominal segments with a pair of elongate, curved, well separated yellow spots, first and second abdominal tergites prominently pubescent marginally, medially sparsely pubescent with white pile on the two yellow areas. Posterior margins of fourth and fifth abdominal segments yellow.

Length: Body 11.25 mm, wing 8.75 mm.

Holotype. One female on pin. "India: Kalatop (11.2 km. from Dalhausie), 2440 m. 25.9.1962, coll. J. L. Nayar.

The species comes near to *Xanthogramma citrinum* Brun. from India: Mangaldai, but can be easily separated by the presence of a pair of yellow spots on second, third and fourth abdominal segments.

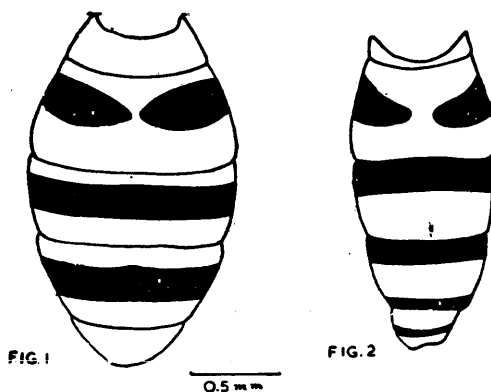


Fig. 1. *Syrphus himalayanus*, sp. nov. (Male Abdomen).

Fig. 2. *Syrphus aequalis*, Walken (Female Abdomen).

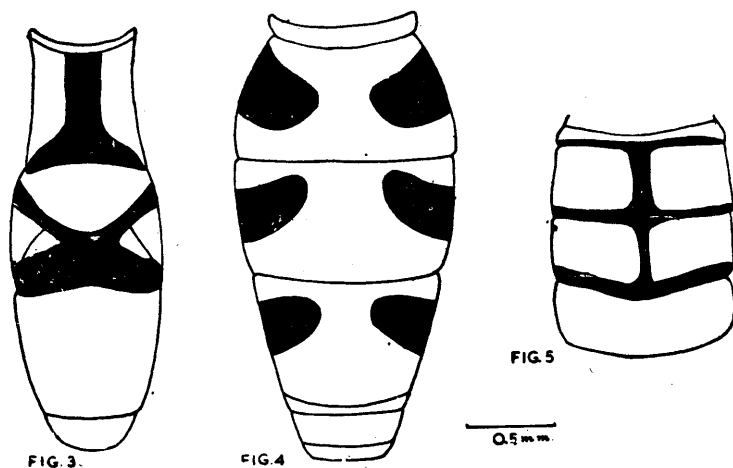


Fig. 3. *Baccha tribeni*, sp. nov. (Male Abdomen).

Fig. 4. *Xanthogramma indica*, sp. nov. (Female Abdomen).

Fig. 5. *Rhingia siwalikensis*, sp. nov. (Male Abdomen).