

**Fauna sumatrensis.**

(Beitrag Nr. 51).

The immature stages of *Gnophomyia Jacobsoni* Alexander (Dipt.).

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(With plate 1).

Through the kindness of Dr. Charles P. Alexander, I have received for study and description larvae and pupae of *Gnophomyia jacobsoni* Alex. These were taken at Fort de Kock, Sumatra, altitude 920 meters, by Mr. Edward Jacobson, who reared a part of the larvae and secured the adult flies previously described in this series of papers by Dr. Alexander<sup>1)</sup>. I am indebted to both Mr. Jacobson and Dr. Alexander for the opportunity of studying this well preserved and abundant material.

Mr. Jacobson's notes on the occurrence of the immature stages are as follows: „Larvae and pupae living under the bractae of the inflorescence of *Hornstedtia*, sp. (*Scitamineae*), causing a slimy putrefaction.“ This habitat is interesting in comparison with the larval habitats of other species of *Gnophomyia* whose immature stages are known: *Gnophomyia tristissima* O. S. (North America), beneath the bark of moist, decaying, hardwood logs<sup>2)</sup>. *Gnophomyia luctuosa* O. S. (North America) in the fissured outer bark of living hardwood trees, as *Magnolia*, beech, sweet gum, red bay and oak. *Gnophomyia tripudians* Bergr. (Europe) from beneath the bark of a fallen Carolina poplar, „in a viscous, semi-decomposed mass of tissue“<sup>3)</sup>, and from dead oak wood<sup>4)</sup>. *Astelobia rufa* Hudson, until very recently considered to be a species of *Gnophomyia*, spends the larval existence in the thick brown liquid in the bases of the leaves of a liliaceous epiphyte, *Astelia solandri*<sup>5)</sup>.

**The Larva** (Plate 1 Figs. 1—6.

Length, 13.5—16.5 mm (the latter females); diameter at 2nd abdominal segment, 1.5—1.8 mm.

<sup>1)</sup> Alexander, C. P., Fauna sumatrensis (Beitrag Nr. 39). Ent. Mitteil., XVI, p. 90, 1927.

<sup>2)</sup> Alexander, C. P., Crane-Flies of New-York, Part II, Memoir 38, Cornell Univ. Agr. Expr. Sta., Ithaca, New York, 1921, mentions *Liriodendron Tulipifera* Linn., cottonwood, and box elder. I have taken the larvae from black locust and hornbeam logs.

<sup>3)</sup> Gamkrelidze, W., Sur la faune des troncs de peuplier. Not seen but quoted by Alexander, Crane-Flies of N. Y., Part II.

<sup>4)</sup> Edwards, F. W., *Gnophomyia tripudians* Bergroth: a new British fly. Not seen but quoted by Alexander, Crane-Flies of N. Y., Part II.

<sup>5)</sup> Hudson, G. V., Illustrated life-histories of New Zealand insects: No. 1. Not seen but quoted by Alexander, Crane-Flies of New York, Part II.

Form moderately elongate, terete; body diameter nearly uniform except for the more slender 1st thoracic and 8th abdominal segments; the segments distinct, the intersegmental indentures pronounced.

Color (alcoholic specimens), a uniform warm buff above, pale buff beneath. The only markings are those of the spiracular disk and the dark line of the alimentary tract. Integument transparent, almost colorless, with a soft, pale, wholly microscopic pubescence. Inconspicuous creeping welts extends across the anterior thirds of the ventral surfaces of abdominal somites 2 to 7. Each welt is composed of some 30 to 35 more or less parallel, transverse rows of minute, close-set points; the rows average about 0.012 mm apart.

Spiracular disk (fig. 2), conspicuous; the central part, small and colorous with the body, but bearing five rather elongate, flattened lobes that have jet black markings and marginal fringes of long, brown hairs. Ventral lobes the longest, broad sub-lanceolate; their faces jet black save for an incomplete median stripe of light buff; at about mid-length the face of each lobe bears a single short seta. Dorso-lateral lobes subspatulate, their faces completely black save for the extreme distal margin. Dorso-median lobe with a bluntly rounded apex, face black, about as long as the distance between the spiracles. Spiracles circular, separated by about twice the diameter of one spiracle, situated at the bases of the dorso-lateral lobes; their centers jet black; the rings rather wide, yellowish brown, radially striated.

Anal gills delicate, snowy white in preserved specimens (presumably sub-hyaline in life), four lobed. Anterior lobes slender, cylindrical, extending laterad beyond the outline of the body; posterior pair of lobes blunt and broadly rounded, not projecting.

Head capsule (fig. 3), comparatively compact, large (1.1 mm long; 0.55 mm broad), markedly flattened dorso-ventrally (depth 0.2 mm). Prefrons margined anteriorly and laterally with dark brown, chitinized bars; remainder of the plate thinly chitinized or membranous, yellowish brown; slightly incised caudally. Lateral plates margined by chitinized bars whose caudal ends are expanded into flat rounded plates; the dorsal and ventral bar of each lateral plate connected by a thin, curved plate of yellow chitin. Prefrons and lateral plates rather widely separated caudally, becoming contiguous just before the mouth parts. Labrum-epipharynx a long, truncated cone, curved ventrad thru approximately 90 degrees; the dorsal surface with two small membranous lateral areas at about mid-length, each bearing three, minute, peg-like papilli; apex and apical ventral surface with tufts of reddish hairs, the lateral tufts of the apex particularly prominent. Antenna with the basal joint cylindrical, minutely pubescent, length 0.06 mm, diameter 0.03 mm; at

its apex it bears the second joint and two or three minute peg-like appendages. Second joint slender cylindrical, its apex conical; length 0.03 mm, diameter 0.01 mm. Mandibles (fig. 4), flattened, rather elongate, curved ventro-mesad; apical tooth prominent, flattened conical, moderately curved; a single blunt dorsal tooth at the base of apical tooth; three flattened, triangular teeth on ventral margin; a rounded lobe at about mid-length of the mesal surface. Maxillae prominent, projecting cephalad of the tips of the antennae, membranous, somewhat bean-shaped, the concave margin mesad; their surfaces covered with long, pale hair; just ventrad of the truncated apex, each bears a small mushroom-shaped papillus. Mentum (fig. 5) rather vestigial; the mental bars slender, weakly chitinized and ending in two small teeth, the inner tooth but partially chitinized; connecting the apical ends of the two mental bars is a membranous band that bears three small tooth-like projections to either side of the mid-ventral line. Hypopharynx (fig. 6) supported by a pair of sinuous, chitinized rods. No chitinized plates are evident but there is an extensive hood-shaped anterior membrane that bears numerous rows of small chitinized points; a narrow caudal membrane bears a broad sheet of caudally directed, long slender fibers.

Besides the larger larvae, that are believed to be full grown, the collection contained a number of smaller larvae of this species. These fell into two well marked size groups: length 8.5 mm; diameter 0.9 mm; and length 5 mm, diameter 0.5 mm. Except for their size, these are quite like the full grown larvae in all details.

#### *The pupa* (Plate 1, figs. 7—9).

Male, length 11 mm; measurements at base of wing pad: dextro-sinistral, 1.9 mm; dorso-ventral, 1 mm.

Female, length, 13.4 mm; measurements at base of wing pad: dextro-sinistral, 2.5 mm; dorso-ventral, 1.3 mm.

Form, moderately elongate, markedly flattened dorso-ventrally. Color: eyes, wing-pads, and tarsal sheaths dark brown, remainder of head and thorax dark yellowish brown, the bases of the prothoracic legs yellowish, abdomen orange yellow.

Cephalic crest represented by two, small, rounded, widely separated projections, each bearing a stout, yellowish brown seta. Vertex and front broad, the latter quite flat. Eyes widely separated. Antennal sheaths extending to the knees of the mesothoracic legs, their basal portions slightly angulate. Labrum diamond-shaped, the caudal margins concave, labial lobes small, widely separated by the rounded tip of the labrum. Maxillary sheaths cylindrical, straight, extending two thirds across the knees of the prothoracic legs.

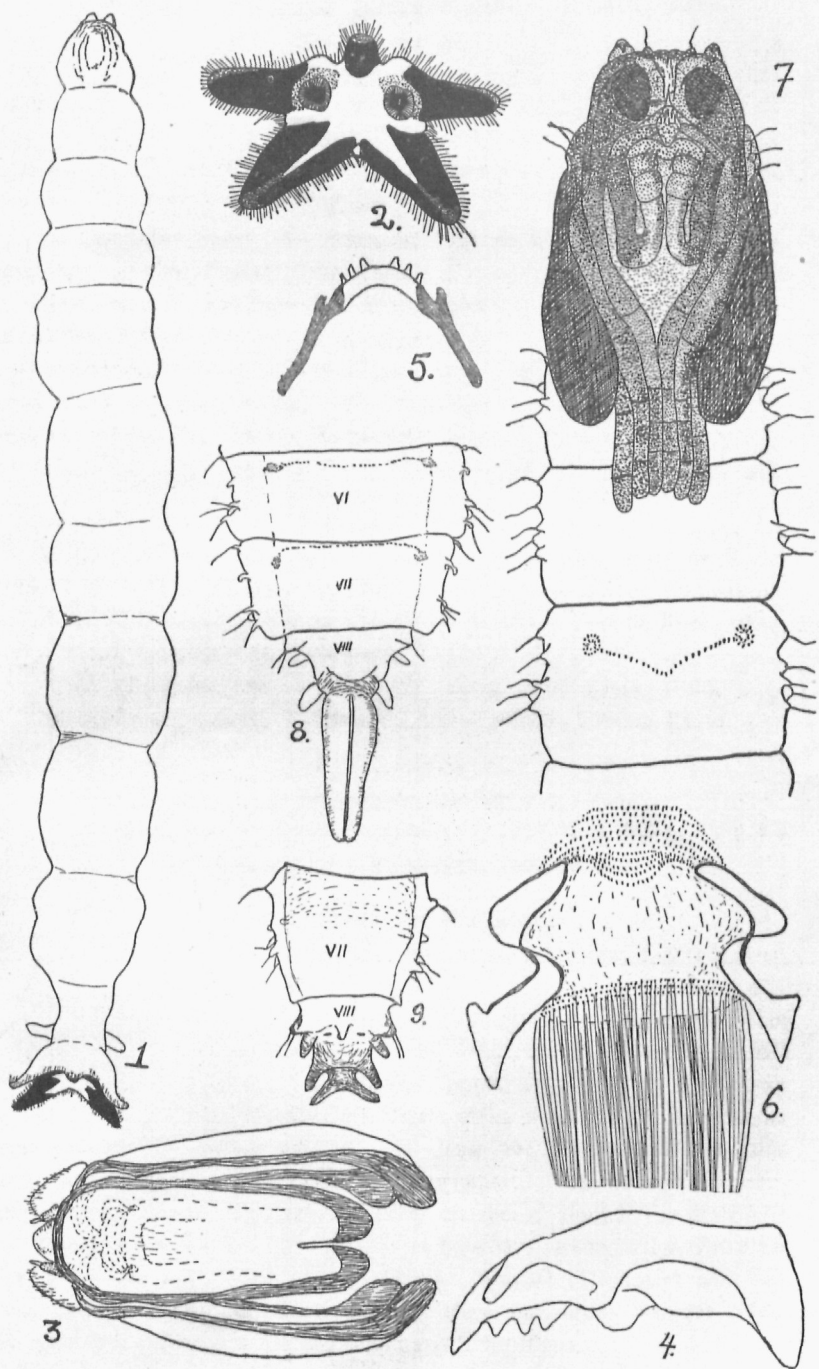
Pronotal breathing horns stout, cylindrical, heavily chitinized, closely applied to the sides of the thorax so that from in front they appear conical, their apices rounded and curved ventrad. Thorax well chitinized; mesonotal crest flattened but projecting cephalad between the pronotal breathing horns, its anterior margin roughened and turned ventrad. Sides of thorax with several small rounded, well chitinized projections, each bearing a single stout seta. Wing sheaths chitinized, quite short, extending a little past mid length of the 2nd abdominal segment. Tarsal sheaths short, ending opposite the middle of 3rd abdominal segment; metathoracic tarsi slightly the longest; prothoracic slightly the shortest.

Abdominal segments not divided into distinct annuli. Segments 2 to 7 with 5 stout setae on each lateral margin. Each seta is borne from a small rounded elevation; the first pair (one member on either pleuron) arise near the cephalic margin of the segment; the next pair are at about mid length; the remaining three pairs are closely grouped midway between the second pair and the caudal margin. The tergites of segments 3 to 7 have 3, low, transverse welts armed with minute chitinous points, just beyond their cephalic margins. Sternites 4 to 7 have each a single row of minute points, the rows ending laterally in small wart-like projections that bear a group of slightly larger points. The eighth abdominal segment is abruptly narrower than the seventh. Near the cephalic end it bears at either side, two setae, on the dorsal surface are borne the five prominent lobes of the larval respiratory disk as well as vestiges of the spiracles. Male cauda with a large disk-shaped ventral lobe and a conspicuous dorsal Y-shaped lobe, the arms of the Y forming a very obtuse angle. Female cauda with the ovipositor sheath very elongate, stout, and conspicuous.

#### Explanation of Plate 1.

##### Larva and Pupa of *Gnophomyia jacobsoni* Alexander.

Fig. 1. Larva, dorsal view. — Fig. 2. Spiracular disk of larva, caudal view. — Fig. 3. Head capsule of larva, dorsal view. — Fig. 4. Mandible of larva, dorso-medial view. — Fig. 5. Mentum of larva, ventral view (the unshaded portion is a thin membrane). — Fig. 6. Structure of hypopharynx, ventral view of cleared mount. — Fig. 7. Pupa ventral view. — Fig. 8. Cauda and last three abdominal segments of female pupa, ventral view. — Fig. 9. Cauda and last two abdominal segments of male pupa, dorsal view.



Rogers, The immature stages of *Gnophomyia Jacobsoni* Alex.