A REMARKABLE DIPTEROUS INSECT FROM JAPAN, NYMPHOMYIA ALBA, GEN. ET SP. NOV.[1]

ONE PLATE

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Along a torrential stream at Kibune, Kyoto, in March 1932 I collected six specimens of this extraordinary fly to be described below. This fly is so peculiar that there seems no family to which it can be assigned. The body resembles that of a certain caddice-fly larva and the wings those of thrips rather than any of known dipterous insects. After consulting my colleagues at the Entomological Laboratory of the Kyoto Imperial University, and on receiving special suggestions from Prof. Dr. C. P. Alexander, Prof. Dr. G. C. Crampton, Prof. Dr. T. Esaki, and Dr. F. W. Edwards I have no question that the insect represents a new dipterous type for which it will be necessary to erect a special family. This new family undoubtedly belongs to the suborder Orthorrhapha rather than to the Cyclorrhapha, and especially to the series Nematocera because of the structures of the terminal abdominal segments, although the antennæ simulate closely those of the Brachycera.

Detailed studies on this family will be published in a later contribution in the Memoirs of our College.

I am deeply indebted to Prof. Dr. Hachiro Yuasa for his kind help which made this report possible. Acknowledgments are also due to Prof. Dr. C. P. Alexander, Prof. Dr. G. C. Crampton, Prof. Dr. T. Esaki and Dr. F. W. Edwards for their invaluable suggestions.

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Fam. NYMPHOMYIIDÆ, nov.

I propose to define the family as follows:

Head small, conical, prolongated cephalad forming a snout, articulated with a broad cervix. No trace of mouth-parts. Prognathous in type. Compound eyes contiguous ventrally. Ocelli large, paired, present laterally caudad of the compounde eyes. Antennæ brachycerous type, 5-segmented, shorter than the head, third segment larger than the preceding two segments taken together and the terminal two segments vestigial.

Thorax elongated, cylindrical; pronotum small, completely separated at middle; no suture between the mesonotal præscutum and scutum; mesopostscutellum extremely elongated, as long as the cephalic sclerite (præscutum and scutum taken together); metanotum much reduced. Each segment provided with a large and independent sternum. Spiracles absent.

Abdomen with nine distinguishable segments in both sexes including the genital; elongated and quite cylindrical as in the thorax; each segment subequal in shape, size and structure excepting the two terminal abdominal segments. Abdominal spiracles wanting.

Legs slender but small. Coxæ and trochanters extremely elongated. Tibial spurs wanting. Tarsus 5-segmented, with normal terminal structures. Fore legs articulated laterally while the posterior two pairs ventrally; three pairs very widely separated from each other, the distances between them being subequal to each other.

Wings very long and triangular, covered with dense microtrichiæ and with a fringe of very long hairs around the whole margin. Macrotrichiæ of the membranous surface wanting. Alula and squama absent. Venation very feebly developed and veins reduced in number. Wings held erect on the back as in the butterfly at rest.

Halteres very long and well developed, widely separated from the bases of the wings.

Typical genus:—*Nymphomyia*, gen. nov.

Nymphomyia, gen. nov.

The new genus has the characters of the family.

Very small, delicate and feeble flier.

This genus is so unique that it is difficult to point to any known genera as its allies but it might be possible to suggest a remote resemblance with certain forms of the Psychodidæ and Cecidomyiidæ. The Psychodidæ, especially *Phlebotomus*, itself one of the most aberrant groups of the Diptera, is somewhat suggestive of this genus, but they differ distinctly in the form of the head-capsule and antennæ, the presence of large ocelli, the possession of elongated coxæ and trochanters, the absence of the definite parallel venation and macrotrichiæ of the wings, and the presence of extremely long fringe of the wings. Among the Cecidomyiidæ, the Heteropezinæ might be mentioned for comparison but they also obviously differ in the shape and structure of the head-capsule, antennæ, mouth-parts, thorax, and coxæ of legs and eighth abdominal segment.

Genotype :—*Nymphomyia alba*, sp. nov.

Nymphomyia alba, sp. nov.

General coloration white in life and slightly opaque, pale yellowish white in alcoholic specimens ; head slightly brownish ; wings snowy white.

MALE :—

Head small, conical, prolongated cephalad forming a snout, prognathous in type, with scattered slender setæ. No definite sutures on the head-capsule. Occipital foramen as large as the head itself being connected with the broad cervix. Compound eyes rather small, granulose, without velutinous hairs on the surface, each with about 40 biconvex facets, contiguous on the ventral side but separated on the dorsal side. Large paired ocelli present on the lateral side of the head caudad of the compound eyes. Cephalic end (snout) of the head-capsule somewhat curved ventrad. Mouth-parts completely atrophied ; its opening located on the ventral side of the base of the snout, cephalad of the ventral margin of the eyes, on the in-most part of the pocket-like cavity between the snout and the labium-like projection of the head-capsule. Antennae located closely near by each other on the dorsal side of the base of the snout, 5-segmented ; their bases slightly

covered by the small projection of the head-capsule; antacoria very small. Scape somewhat pyriform bearing several marginal setæ. Pedicel spherical, slightly smaller than the scape, without setæ. Third segment somewhat spoon-like in shape, largest, larger than the preceding two segments taken together, rather membranous in structure, covered with microtrichiæ but without macrotrichiæ. Remaining two terminal segments very minute; penultimate segment subequal in length to width; ultimate pointed, slender conical, thrice as long as the preceding; a few sensilla found between the terminal two segments.

Thorax scantily haired with slender setæ, quite cylindrical, subequal in diameter from end to end, extremely elongated, not produced over the head. Pronotum completely separated at middle into a paired lateral parts, each provided with several setæ. Mesonotum occupying the entire dorsal surface of the thorax, being divided into three sclerites such as the præscutum-scutum, scutellum, and postscutellum. Præscutum-scutum produced by a perfect fusion of the two sclerites losing the suture between them, without setæ excepting the supra-alar setal group which is represented only by a single seta. Scutellum somewhat pentagonal in shape, with two pairs of long marginal and one pair of minute median setæ. Postscutellum very long, fully as long as half of the entire mesonotum, quite bare, major portion of its caudal region infolded into the first abdominal segment.

Prosternum with a pair of small setæ on its cephalic corners. Mesosternum subdivided into the thickened sternannum and membranous sternellum bearing a pair of small setæ between them and the latter with the mid-ventral suture. Metasternum also provided with the mid-ventral suture and without setæ. Coxafossæ of three paired legs all very small.

Abdomen with nine segments including the genital, very much elongated, quite cylindrical having nearly equal diameter throughout the whole length and moreover subequal in diameter to the thorax, covered with a fine microscopic pubescence, scantily haired with slender setæ on the caudal region of each segment, with a large, bare, V-shaped, transparent puncture on each sternite and a few scattered small punctures on the cephalic region of each segment. Paired brown large tubercles on the cephalic portion of the pleurite of each segment and

various number of tubercules which are arranged in a transversal line on the caudal region of each tergite. Segmental differentiation on the abdomen is very poor and the segments are subequal in shape, size and structure to each other excepting the first and two terminal abdominal segments. First segment somewhat elongated and more simple in structure than the others. Penultimate, eighth, segment highly modified and very much different in sexes especially in the structures of the lateral appendages. Each lateral appendages consisting of two projections, dorsal and ventral; the dorsal projection not thickened, covered with the common pubescence, with two small tubercles on its base while the ventral is more slender but highly chitinized, with a large tubercle on its base. These two projections are large and extending caudad as far as the caudal margin of the eighth segment.

Both the spiracles and tracheæ completely atrophied not only in the abdomen but also in the thorax.

Hypopygium very simple in structure, normal in position, not turned or rotated. Cerci large, straightly extending caudo-ventrad; completely and immovably united with the caudal end of the ninth segment, with many small setæ on the surface. Coxites very long and slender, completely fused to the ninth sternite, extending caudad as far as the cerci, located ventrad of the cerci, without lobes or modifications of any sort, practically without setæ, with fine curved pubescence on their ventral ridges. Styles simple, small, narrowed apically, each with a small, blunt and membranous projection on the base. Ædeagus very broad, prominently projected caudad from the caudal margin of the ninth sternite, mainly membranous, supported by the chitinized frame-like structure on its lateral sides and distal part.

Legs very delicate in structure, slender, small for the size of the insect, similar in structure and subequal in length to each other, scantily haired. Fore legs widely separated, articulated laterally with the thorax while the other pairs closely approaching and articulated ventrally; the distances between the three paired legs very wide, being subequal to each other. Coxae large and very much elongated; trochanters also elongated; the total length of these two proximal segments is longer than any one of other segments of the legs. Femur and

tibia of one leg subequal in length to each other; each subdivided into two regions on the proximal part by a broad membranous ring. Middle tibia somewhat enlarged apically while the others quite cylindrical. Tibial spurs completely wanting. Tarsi 5-segmented; each articulation somewhat oblique; each tarsal segment with a few minute apical seta, third and fourth tarsal segments each provided with a microscopic apical spine. First and fifth tarsal segments subsequal in length to each other on one leg; on the fore and middle legs they are about half as long as the tibia respectively while on the hind leg they are slightly longer than one-third of the tibia. Claws slender, large, simple and empodium also slender, as long as the claws. Pulvilli wanting.

Wings extremely elongated, very narrow, quite triangular in shape; alula, squama and anal lobe quite atrophied. There are no macrotrichiæ on the membranous area but there is a very long, delicate and thick fringe around the whole wing margin, that of the caudal margin is especially long and about one and half as long as the largest width of the wing. Veins very much reduced being represented by slight thickenings of the membrane. Most obvious vein R_1, almost straight, ending on the costal margin at about the proximal quater of the length of the wing; R_{2+3} completely atrophied; R_{4+5} almost atrophied especially on its proximal part, terminated on the costal margin a little beyond the end of R_1; *Cu* very slightly thickened, extending along the anal margin being atrophied on the distal part; *M* very faint, crease-like, located on the middle part of the wing being atrophied both at the base and the tip.

Halteres situated very widely from the base of the wings, pale yellowish white, each with long, slender and straight stem and with a spoon-like knob; usually bare, occasionally with one or more macrotrichiæ.

FEMALE :—

As the sexual dimorphism is very weak, the distinct differences are shown only on the terminal abdominal segments. The lateral side of the eighth abdominal segment on the caudal part with a large and flattend projection which is extended ventro-mesad along the caudal margin of this sternite and bears a long seta on its basis. Besides the above projection there are two small tubercles on the

latero-cephalic parts. The small terminal region quater-spherical, truncated ventrally and consisting of the broad, dorsal, ninth segmacoria and the terminal, ninth segment. Ninth segment with several long setæ on the ventro-caudal margin and a pair of setigerous cerci on the ventro-cephalo-lateral corners. Cerci long and quite cylindrical being completely and immovably fixed and straightly extending ventrad. Setæ and tubercules of the abdominal segments somewhat less in number than in the male. Wings very slightly blunt at tip than those of the male. Other structures of the head, thorax, wings, legs and abdominal segments are practically identical with those of the male.

MEASUREMENTS (average of two each of females and males) :—

The following are taken from the alcoholic specimens.

Body, length	2.30 mm.
Head, length	0.22 mm.
Head, greatest width	0.13 mm.
Thorax, length	0.64 mm.
Thorax, greatest width	0.22 mm.
Abdomen, length	1.56 mm.
Abdomen, diameter	0.16-0.19 mm.
Wing, length	2.50 mm.
Wing, greatest width	0.04 mm.
Fore leg	0.79 mm.
Coxa + Trochanter	0.18 mm.
Femur	0.14 mm.
Tibia	0.16 mm.
Tarsus	0.30 mm.
Middle leg	0.77 mm.
Coxa + Trochanter	0.20 mm.
Femur	0.16 mm.
Tibia	0.16 mm.
Tarsus	0.19 mm.
Hind leg	0.65 mm.
Coxa + Trochanter	0.18 mm.
Femur	0.16 mm.
Tibia	0.15 mm.
Tarsus	0.27 mm.

Habitat—Kibune, Kyoto Prefecture, Japan.
Holotype—Male; Kibune, Kyoto Prefecture; March 10, 1932.
Allotopotype—Female; Mar. 10, 1932.
Paratopotypes—Two males and two females; Mar. 10, 1932.
Type-specimens—Alcoholic; deposited in the Entomological Laboratory, Kyoto Imperial University; collected by M. Tokunaga.

While this paper has been passing through the press, I have collected another male specimen of the present species at Kurama, Kyoto Prefecture, October 23, 1932 in the successive survey for this species after the discovery in this spring. This male is slightly smaller than the vernal form and was also lowly flying over a torrential stream in the twilight of the evening. Immature forms are not known yet.

PLATE

PLATE 34

Nymphomyia alba, gen. et sp. nov., male.

A REMARKABLE DIPTERON NYMPHOMYIA ALBA, GEN. ET SP. NOV. PLATE 34

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