REVISION OF SOME JAPANESE HORMAPHIDINAE (APHIDIDAE), WITH THE DESCRIPTIONS OF NEW GENUS AND SPECIES

Kota MONZEN

邦産五節綿虫亜科の再検討

門前弘多

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Introduction

I published already some papers on the gall producing aphids. Thereafter many authors contributed on the knowledges of Aphididae. I have been also studying on them and got some one to be added to the list of aphid. In this paper I tried some revision on the genera; *Hamamelistes*, *Mansakia*, *Nipponaphis*, *Astegopteryx* and *Schlechtendalia*, and at the same time described one new genus and its type species together with two *Hamamelistes*.

Acknoledgment: In this opportunity I express my cordial thanks to Messrs. Kashiyama, Fujimaki and Abe who collected and sent me specimens of aphids for my study. I am also much indebted to Messrs. Kikuchi, Ishizuka and Okano who gave me kind advices and helps.

Genus Hamamelistes SCHIMER

1867, *Hamamelistes* SHIMER, Trans. Am. Ent. Soc. V. 1, P. 284.
1896, *Tetraphis* HORVATH, Wien. Ent. Zeit., V. 15, P. 6.
1901, *Cerataphis* MORDWILKO, Zur. Biol. u. Morph. d. Pflanz. T. 2.

1901, *Hamamelistes*, PERGANDE, U. S.. Dept. of Agric. Divis. of Ent., Tech. Ser. n. 9.
1907, *Hormaphis*, MORDWILKO, Biol. Zentralb., V. 27, PP. 793-795.
1909, *Hamamelistes*, TULLGREN, Arkiv. f. Zool., 14, 49; 1915, VAN der GOOT, Beiträge zur Kenntnis der Holländischen Blättläuse; 1920, BAKER, U. S. Dept. of Agric. Bull. No. 826, P. 83; 1924, GAUMONT, Des Annales des Epiphyties, T. 9; 1929, THEOBALD, Plant lice or Aphid. of Great Britain, V. 3; 1929, MONZEN, Saito Ho-onKai, Monogr., No. 1, PP. 18-20; 1930, BÖRNER, Archiv f. Klassif .u. Phylog. Ent., B. 1, H. 2; 1934, MONZEN, Bull. of Sci. Res. of Alum. Ass. of Morioka Coll, of Agric. and Forest,, V. 9, P. 22; 1941, Shinji, Nippon Gachu Sosetu.

Genus *Hamamelistes* was at first erected by SCHIMER in 1867, as the type with aphids found on the leaf of witch-hazel, and was described including 2 gall making species. One of which was renamed *Hamamelistes cornu* for *Byrsocrypta hamamelidis*, has been before named by FITCH. Afterwards OSTEN SACKEN erected genus *Hormaphis* as the type with *Hamamelistes cornu* (*B. hamamelidis*). PERGANDE considered that for *Spinosus* SHIMER should be retained genus *Hamamelistes* as its antennal character is very different from that of *Hormaphis*. So genus *Hamamelistes* was defined by PERGANDE as the type with *spinosus* SHIMER, which producing the spiny bud gall on *Hamamelis virginica* (witch-hazel), and studying on the life-history of the species, stated that *Hormaphis papyraceae* OESTLUND(1) corrugating the leaf of *Betula americana* (Birch) in Minnesota is the return migrant of *Hamamelistes spinosus*. Namely this species is the migratory aphid inhabiting both witch-hazel and birch. The winter egg of this species is deposited in June or July on witch-hazel, and hatches in May or June of the next year. They producing gall on the flower bud, the migrant fly off from July to late Autumn from the spiny gall, and give birth to young on the leaf of birch. After feeding they go to the twig and become coccid-like forms, then hibernate there. In the middle of April the coccidiform give birth to young, they suck on the underside of the leaf. Early in June alate sexuparous flying back to witch-hazel, give birth to sexuals. In U. S. A. several aphidologists(2)(3) supported this fact of the migration of the species.

In Europe no body stated on the spiny gall and its aphid of witch-hazel, but many authors described on only the curious aphid, *Hamamelistes betulae* living on the leaf of birch which is the winter host of *H. spinosus* in U. S. A. On the life history of *H. betulae*, TULLGREN(4) and BÖRNER(5) stated that there are parallelism of the alate sexuparous female and coccidiform. MORDWILKO(6) considered that in Tertialy period this species has been liviug a migratory life in Europe as in America, but in Glacier age

(1) 1887, OESTLUND, Bull, 4 of the Geological and Natural history survey of Minnesota, P. 17.
(2) 1926, BAKER, MASON, PATCH and etc, A list of the insects of New York,
(3) 1931, HOTTES and FRISON, Plant lice or Aphiidae of Illinois,
(4) 1909, TULLGREN, Aphidologische Studien, I. P. 58.
(5) 1914, BÖRNER, Blattlausstudien, Abh, Nat. ver. Brem., B. 23. H. 1.
(6) 1923, MORDOWILKO, Compt. rend. a l'Acad. des sci. de Russie.

Hamamelis disappeared from here and living on birch parthenogenetically. According to GAUMONT[1] in France *H. betulae* has only three forms reproducing parthenogenetically instead of *H. spinosus* is a migratory aphid in U. S. A.

In Japan the present writer reported *Hamamelistes shirakabae* which having three segmented antennae and tarsiless legs in both coccidiform and aestivalis living on *Betula japonica*, and it was not found to migrate to *Hamamelis japonica* growing near by each other.

I describe here a known and 2 new species, belonging to this genus.

Hamamelistes shirakabae MONZEN (Pl. I, f. 1.; pl. II, F. 1, 2, 3)

1929, *Hamamelistes shirakabae* MONZEN, Saito Ho-on Kai, Monogr. no. 1, p. 61; 1934, MONZEN Bull. of Sci. Res. of Alum. Ass. of Morioka Coll. of Agric. and Forest. V. 9.

1941, *Hamamelistes tullgrenii* DE MEYER,[2] SHINJI, Nippon Gachu Sosetu.

1941, *Hamamelistes betulae* VAN DER GOOT, SHINJI, Nippon Gachu Sosetu.

Hibernating coccidiform (Hiemalis from the twig of Betula.)

Coccus-like, reddish brown, oval, rather convex, with 4 spots of two rows, circumference toothed, length 1.25 mm. width 1.17 mm., the rostrum small, dark brown. Antennae short, dark brown, 3 segments. Legs short, dark sbrown, abnormal, the fore and middle legs without tarsi, hind with each a small protuberance, no claw. Cauda semicircle, not constricted at the base.

Apterous form (first generation, aestivalis)

Body oval. very swollen, dark reddish brown, length 1.84 mm. width 1.34 mm., rostrum short and thick, reaching to the first coxae. Antennae brown. 3 segments, 3rd long and thin, length 0.2 mm. Legs short and abnormal, the fore and middle without tarsi, the hind with very short one-segmented tarsi, no claw. Cornicles wanted. Cauda rounded, somewhat constricted at the base. Anal plate bilobed with many hairs.

Alate viviparous female (migrant on the leaf of Betula in June)

Body oblong, yellowish green, length 1.58 mm. Antennae yellowish, 5 segments, I II short, III the longest about as long as IV and V combined, IV and, V nearly equal in length III–V with numerous narrow annular sensoriae, the relative length and sensoria are as follows;

Antennal seg.	I	II	III	IV	V
Relative length	4	4	30—32	15—17	15—18
Sensoria			30	11	11

Wings held flat in repose, veins brown, stigma yellowish brown; fore wing with M_2 and Cu quite near by each other at the bases, M_1 simple, obsolate at the base; hind wing with M and Cu apart from each other at the bases, hooklet 2. Legs normal, yellowish, tarsi with two long capitate hairs. Abdomen yellowish. Cornicles small not distinct. Cauda concolor,

(1) 1924, GAUMONT, Des Ann. des Epiphyties, T. 9.

(2) According to THEOBALD *Hamamelistes tullgrenii* DE MEYER is a Synonym of *H. betulae* MORDWILKO.

rounded, constricted at the base. Anal plate bilobed, with many hairs.

Autumn alate form (on the leaf of Betula in September)

Body oblong, yellowish, head and thorax brownish, length 1.55 mm. Antennae yellowish, 5 segments, III—V armed with many narrow annular sensoriae which nearly encircled the segment, the relative length and sensoria are as follows:

Antennal seg.	I	II	III	IV	V
Relative length	4	4	27—30	15—17	15—16
Sensoria			17—23	12—13	8—10

Fore wing with M_1 simple, obsolate at the base, M_2 and Cu united together at the bases, hind wing with M and Cu near by each other at the bases. Legs yellowish, thin, tarsi with 2 long capitate hairs. Cornicles wanting. Cauda rounded, constricted at the base. Anal plate bilobed, with many hairs.

Gall (Shirakaba hamaki)

Leaf curl: This aphid attacks the underside of the leaf of *Betula (japonica) Tauschii* KOIDZ. (Shirakaba) The attacked part protrudes toward the surface, the color turns to yellowish.

Locality: Iwate prefecture (Morioka, Hayachine, Komagatake.)

Remarks: This species resembles to American *H. spinosus.*(1)(6) and European *H. betulae* (2)(4)(5) in living the leaf of Betula and having the peculiar coccidiform and aestivalis, but *H. shirakabae* differs from those in the following points;

1. M_2 and Cu of the fore wing of this summer alate form arising quite near at the bases, and united together to a common stalke at the bases in the autumn alate form.(2)(4)
2. The hind wing with always well developed M and Cu.(1)(2)
3. The cornicles of these alate forms are wanting (2)
4. The coccidiform of this species without constricted cauda at the base and bilobed anal plate as in European species.(2)(4)(5)

Hamamelistes cristafoliae n. sp. (Pl. I, f. 2. pl. II, f. 6-13)

Alate viviparous female (Spring migrant.)

Body dark brown, antennae and legs brownish. Eyes black, with no tubercle. Antennae 5 segments, I II short, III the longest, longer than IV and V combined, III—V armed with narrow annular secondary sensoriae; the ridges of sensoria brownish, encircle of the segment, the relative length and sensoria are as follows;

Antennal seg.	I	II	III	IV	V
Relative length	3	3	23—24	6—7	5—8

(1) 1901, PERGANDE, The life history of two species of plant lice.

(2) 1909, TULLGREN, Aphidologischen Studien, I.

(3) 1915, VAN DER GOOT, Beiträge Zur Kenntnis der Hollendischen Blattläuse.

(4) 1929, THEOBALD, Plant lice or Aphididae of Great Britain, V. III, P. 316.

(5) 1924, GAUMONT, Contribution a l'etude des Aphididae de France.

(6) 1931, HOTES and FRISON, The plant lice, or Aphiidae of Illinois.

Sensoria	10—13	7	3

Thorax dark, rather flat, Y shape furrow inconspicuous. Wings held flat in repose, fore wing M_1 simple, obsolate at the base, M_2 and Cu very near each other at the bases, stigma light yellow, subcosta obsolate at the distal half, hind wing with 2 obliques far from each other, hooklet 2. Legs normal, with 2 capitate hairs on the tarsi. Cornicles indistinct. Cauda spherical, constricted at the base. Anal plate bilobed with sparse, short hairs.

Length (mm.) Body 1.26 width 0.68 antenna 0,42 wing 2,23

Stem mother (in the gall)

Body oblong, swollen, reddish yellow, with sparse, fine hairs. Eyes reddish brown. Antennae 4 segments, I II thick, III longest and thin, IV short, the relative length as I 5, II 6, III 15, IV 6. Legs abnormal, the front and middle without tarsi, the hind with small protuberances, 2 hairs, no claw, femora and tibiae rather thick, dark brown. Cornicles wanting. Cauda rounded with 4 long hairs. Anal plate semicircle with long hairs.

Length (mm). Body 2,23 width 1.45 antenna 0.31

Apterous form (in the gall)

Body oblong, reddish yellow. Eyes reddish, composed of 3 facets. Antennae yellowish. 4 segments. Cornicles wanting. Cauda and anal plate rounded. Legs normal.

Gall (Udaikaba muretosakafushi) 1932, Monzen, Chuei no Kenkyu, III.

Leaf gall; The gall produces on the upperside of the leaf of Udaikaba (*Betula maximowicziana* REGEL). Small, cockscomb-like bags, gregariously protruding between the side veins. The exit hole opened on the underside of the leaf.

Locality: Mount Iwate (1931, Monzen,) Hachimantai (1952, Fujimaki.)

Type: The Biological Laboratory of the Iwate University.

Hamamelistes gibberi n. sp (Pl. I, f. 4; pl. II, f. 4, 14)

Alate viviparous female (Spring migrant)

Head and thorax black, abdomen yellowish brown. Eyes black, no tubercle, frontal ocellus not protrudes. Antennae dark yellowish, 5 segments. I II thick, III the longest, shorter than IV and V combined, IV and V nearly equal in length and a little thinner than III, III—V armed with narrow annular sensoriae, encircle of the segment, the relative length and sensoria are as follows;

Antennal seg.	I	II	III	IV	V
Relative length	4	4	25	13—15	13—15
Sensoria			22—27	13—14	9—15

Thorax rather flat, the frontal margin nearly straight, not divides to lobe by furrow, Wings held flat in repose, the stigma of the fore wing a little angulate at the hind margin. M_1 simple, obsolate at the base, M_2 Cu very near or shortly united together at the bases, hind wiug with M and Cu far from each other, hooklet 2. Legs normal, dark brown, with 2 capitate hairs on the tarsi. Cornicles black chitinous circles. Cauda ronnd, strongly constricted at the base, with 2 long hairs. Anal plate bilobed, broadly separate toward the

apex, with 3—5 hairs on each edge.

Length(mm) Body 1.5 Width 0.78 Antenna 0.58 Wing 2.57

Stem mother (in the leaf curl)

Body oval, swollen, greenish with sparse short hairs, length 1.6mm. width 1.2mm. Vertex with 4 long hairs. Eyes black, small. Antennae yellowish brown, 4 segments, relative length is I 4, II 6, III 12, IV 7. Legs brownish, abnormal, the front and middle tarsiless, the hind with a wart-like protuberance, 2 long hairs, no claw. Cornicles black, small tubercles. Cauda semicircular. Anal plate bilobed with some hairs.

Apterous form (in the leaf curl)

Body oblong, greenish, with sparsely rather long hairs. Antennae 4 segments, yellowish green, I II short and thick, III the longest, IV rather short. Cornicles small, dark brown. Cauda and anal plate round.

Gall: (Dakekaba hakobufushi.)

Leaf curl: This aphid live on the underside of the leaf of *Betula ermanii* CHAM. var. *communis* KOIDZ., then the leaf protrudes on the upperside here and there, sometimes wart-like, and turns to yellowish. This species relates to *H. shirakabae*, but this aphid differs from the latter in the following points:

1. The antennae and legs of this species are dark brown.
2. The cornicles are chitinous rings on both alate form and stem mother.
3. The antennae of this stem mother are 4 segnents instead of 3 segments of the latter's.
4. This stem mother has some hairs on the vertex and Body.
5. The cauda of this stem mother is semicircular.

Hamamelistes gibberi biological race **grossae** n. race
(pl. I, f. 3; pl. II, f. 5, 15.)

Alate viviparous female (in the leaf curl of *Betula grossa* var. *ulmifolia*.)

This aphid similar to *H, gibberi* but rather differs from it in the following points. I think it will be because of the different host.

1. This aphid is rather larger than *H. gibberi* (1.84: 1.55 mm.)
2. The M_2 Cu of the fore wing of this aphid shortly united at the bases.
3. The hooklet of the hind wing 3, instead of the latter's 2.

Gall. This aphid curls the leaf of *Betula grossa* SIEB, et ZUCC. var. *ulmifolia* Makino. It was collected at Hayachine, Iwate Prefec. by the author.

Genus **Mansakia** MATSUMURA

1917, *Mansakia* MATSUMURA, A Coll. Essays f. Y. Nawa, P. 59; 1920, BAKER, U. S. Dept. of Agric. Bull. N. 826, P. 85; 1929, MONZEN,(1) Saito Ho-on Kai, Monogr, n. 1, P. 11—14; 1934, MONZEN, Bull, of Sci. Res, of Alum. Ass, of Morioka Coll. of Agric, and Forest., V. 9.; 1941, SHINJI, Nippon Gachu Sosetu. 1930, *Hamamelistes*, BÖRNER, Archiv. f. Klassif. u. Phylog. Ent., B. 1, H. 2.

Genus *Mansakia* was erected with *M. miyabei* as the type by Dr. MATSUMURA in 1917. BAKER and others credited on this genus. But BÖRNER considered a synonym of *Hamamelistes* in 1930. *Mansakia miyabei* produces the spiny bud gall on *Hamamelis* as like the gall of *Hamamelistes spinosus* in U. S. A. The present writer described on another 2 species belonging to this genus, *M. gallifoliae* and *M. kagamii* which producing distinct galls on Mansaku (*Hamamelis japonica*) in 1929. One of which *M. gallifoliae* produces a similar conical gall on the leaf of *Hamamelis* as that of *Hormaphis hamamelidis* in U. S. A. But the aphids are different from each other.

Mansakia miyabei MATSUMURA, (Pl. I, f. 10; pl. II, f. 21, 22)

1917, *Mansakia miyabei* MATSUMURA, A Coll. of Essays f. Y. Nawa, p. 60. 1929, Monzen, Saito Ho-onkai, Monogr. n. l. P. 11; 1941, SHINJI, Nippon Gachu Sosetu.

Alate viviparous female (Migrant in the spiny gall of Mansaku)

Head dark brown, frontal tubercle protrudes. Antennae 5 segments, III longer than IV and V combined, IV longer than V. III—V armed with numerous narrow annular sensoriae. The relative length and sensoriae are as follows:

Antennal seg.	I	II	III	IV	V
Relative length	4	5	36—40	19—22	15
Sensoria			30—33	13—18	12—13

Fore wing with M_1 simple, obsolate at the base, M_2 Cu rather long united together at the bases, and Cu not virtical, rather curved toward apex, hind wing with M and Cu arising at the same point, hooklet 3. Cornicles small rings. Cauda knobbed with 4 long hairs. Anal plate shortly bilobed, with a few hairs on each lobe.

Length (mm.) Body 2.34 width 0.84 antenua 0.77 fore wing 3.00

Gall; (Mansaku-igafushi)

This aphid produces the holed spiny gall on bud of Mansaku (*Hamamelis japonica*). The gall large fusiform, yellowish green, with many spines, which are long, flat and pointed: above the petiole a small hole is opened, about 20×8mm.

Locality; Yamagata, Tochigi, Iwate, Aomori Prefectures.

Mansakia kagamii MONZEN (Pl. I, f. 11; pl. II, f. 23)

1929, *Mansakia kagamii* MONZEN, Saito Ho-on kai, Monogr. N. 1, P. 12.

1941, *Mansakia miyabei* MATS., SHINJI, Nippon Gachu Sosetu, p. 1106.

Alate viviparous female (Migrant in the warty gall of Mansaku)

Head black, frontal tubercle not protrudes. Antennae 5 segmeuts, I—III thicker than IV and V, III the longest, IV and V about equal in length, III—V armed with numerous narrow annular sensoriae. The relative length and sensoria are as follows:

Antennal seg.	I	II	III	IV	V

Relative length	4	4	30—32	15—16	12—15
Sensoria			22—25	12—13	10—13

Thorax black mesonotum flat, straight at the frontal margin, the costa and stigma of fore wing yellowish, M_1 simple, M_2 Cu united together at the bases, hind wng with M and Cu separated from each other at the bases. Cornicles chitinous rings. Cauda round, strongly constricted at the base, with 2 long hairs. Anal plate bilobed, each lobe broadly separated.

Length (mm.) Body 1.74 width 0.78 antenna 0.62 fore wing 2.42

Stem mother (in the gall.)

Body oval swollen, greenish yellow. Antennae 4 segments, short, brownish, I II thick, IIIIV thin and about equal in length. Cornicles brownish chitin rings. Cauda round, constricted at the base. Anal plate broadly bilobed. Legs normal.

Gall (Mansaku ibofushi) MONZEN, Chuei no Kenkyu, I, 1929.

Warty pouch gall: This aphid produces a warty pouch gall on the twig of Mansaku (*H. japonica*), more or less gregariously; the gall wall thin with brownish short hairs on the surface, yellowish in color; the exit hole is odened on every wart, diameter about 10mm.

Remarks: Dr. SHINJI considered this species to be a synonym of *M. miyabei*, however *M.kagamii* differs from the latter in the following points;

1. This species is smaller than the latter. (Body length 1.74: 2. 34).
2. The frontal tubercle not protrudes as in the latter.
3. The comparison of the antenna is shown on the following table;

Antenna	Length	Diameter	Sensoria on III
M. kagamii	0.62	0.049	22—25
M. miyabei	0.77	0.068	30—33

4. M and Cu of the hind wing of this species separated from each other at the bases.

Locality; Tochigi (Chujenji), Iwate (Gomiyojin, Amihari) Prefectures.

Mansakia gallifoliae MONZEN (Pl. I, f. 12; pl. II, f. 24)

1929, *Mansakia gallifoliae* MONZEN, Saito Ho-on kai Monogr. n. 1.

1941, *Mansakia gallifoliae* SHINJI, Nippon Gachu Sosetu. P. 1104.

Alate viviparous female (Migrant)

Head dark brown, ocellar tubercle prominent. Eyes black, rather round without tubercle. Antennae dark brown, 5 segments, III—V armed with narrow linear sensoria, some of which not encircle of the segment, V with a primary sensorium near the apex. The relative length and sensoria are as follows:

Antennal seg.	I	II	III	IV	V
Rellative length	5	5	20—28	10—16	9—13
Sensoria			16—28	10—18	10—13

The rostrum not reaches to second coxae. Fore wings; veins and stigma brownish, M_1

simple, obsolate at the base, M_2 Cu united together at the bases. Hind wings with M and Cu arising at the same point at the bases. Legs normal, dark brown. tarsus I with a long hair, and II with 2 capitate hairs. Cornicles inconspicuous. Cauda round, strongly constricted at the base with 2 hairs Anal plate shortly bilobed with some hairs.

Stem mother (in the gall)

Body swollen, length 0.53mm. width 0.58mm., covered with sparse, short hairs. Antennae 3 segments the 3rd longest, and divides 2 indistinctly, the relative length is; I 2.5, II 2.5, III 15. Legs normal, with 2 capitate hairs on the extremities of the tarsi. Cornicles inconspicuous. Cauda rounded with 4 long bristles. Anal plate bilobed with a few hairs.

Gall (Mansaku fukurofushi)

Conical leaf gall; This species produces a conical pouch gall on the upper surface of the leaf of Mansaku (*Hamamelis japonica*) The gall wall thin, surface smooth, the exit hole opned on the under surface of the leaf. Hight 7—10mm. diameter 4mm.

Locality: Iwate, Yamagata, Tochigi, Toyama, Fukui prefectures.

Genus **Quadrartus** n. g.

I received some new galls of Isu (*Distylium racemosum*) from Mr. KASHIYAMA in June 1952. Numerous winged aphids emerged from those. The aphids having 4-segmented antennae and very long 3rd segments, differ from the related genera *Nipponaphis* and *Astegopteryx*. This genus resembles to *Glyphinaphis* VAN DER GOOT and *Okajimaiya* SUENAGA in having 4-segmented antennae, but are distinct in have not transverce furrow between thorax and abdomen, and spiny body of the apterous viviparous female.

Characters: — The antennae of the alate viviparous female are 4 segments, 3rd very long, 3rd and 4th armed with numerous narrow annular sensoriae. Fore wings with media 1 once branched, hind wings with both media and cubitus. Cornicles present as elevated small pores. Cauda small spherical and strongly constricted at the base. Anal plate bilobed. Antennae of the stem mother and apterous viviparous female are 4 segments. Sexuals is not yet known. Genotype *Quadrartus yoshinomiyai*.

Quadrartus yoshinomiyai n.sp. (Pl. I, f. 5; pl. II, f. 16—20)

Alate viviparous female (Spring migrant)

Head; Black brown, eyes black, ocellar tubercle protrudes, vertetx without hair. Antennae 4 segments, 3rd seg. very long, about 5 times as long as 4th, 3rd and 4th armed with narrow annular sensoria. The relative length and sensoria are as follows:

Segment	I	II	III	IV
Relative length	4	4	24—29	4—5
Sensoria			18—22	2—3

Rostrum short, a little passing beyond the first coxae. Thorax; Mesonotum black, flat with a longitudinal furrow at the middle. the frontal margin nearly straight. Wings hyaline, held flat in repose, the costal margin of the fore wings yellowish, subcosta

obsolate at the distal half, stigma yellowish, Stigma yellowish, stigmatic vein arising in the middle, M_1 once branched, gdnerally developing very faintly, M_2 and Cu very near by each other at the bases, hind wings with M and Cu far from each other at the bases, and M very faint, hooklet 3. Legs normal yellowish brown, tarsi with 2 ca.pitate hairs. Abdomen; yellowish green. Cornicles black pores, rather elevated. Cauda small, rounded, constricted at the base. Anal plate somewhat bilobed with a few short hairs.

Body length 1.6—2.0mm, width 0.7—0.9mm, wing length 2.3—2.8mm.

Stem mother (in the gall)

Body nearly globose, dark green, length 0.69—0.82mm, width 0.60—0.76mm. Eyes black. small, vertex with 2 hairs. Antennae 4 segments, short, dark brown,4th with a primary sensorium. The relative length I 3, II 3, III 12, IV 5. Rostrum dark brown, reaching to 2nd coxae. Legs normal. Abdomen swollen. Cornicles chitinous circles, a little elevated. Cauda round, rather contstricted at the base. Anal plate round.

Apterous form (in the gall)

Body greenish yellow with sparse fine hairs. Rostrum, antennae and legs dark brown. Vertex with 2 long hairs, eyes reddish. Antennae rather thick, 4 segments, 3rd very long, 4th short, rather conical. Rostrum reaches to the 2nd coxae. Legs normal, tarsi with 2 capitate hairs. Cornicles a little elevated. Cauda semicircular. Anal plate round with 2 hairs.

Gall (Isu-eda-ibofukurofushi)

Closed pouch gall on the twig of Isu (*Distylium racemosum*), irregularly round with numerous wart-like protuberances, diameter 20—40mm., height 15—20mm., greennish in color, turns to dark brown, gall-wall rather thick, succulent, covering with thick short hairs on the surface. The innerside makes a large room. there live about 200—500 aphids. The exit hole opens on the top of each protuberance, The alate viviparous females fly off therefrom early in April in Wakayama prefec. The summer host is not yet known.

Locality: Ushio-misaki, Sakura-miya, Wakayama prefecture.

Type: The Biological Laboratory of the Iwate University.

Remarks: The specific name is dedicated for Prince Yoshinomiya by the desire of the collector Mr. KASHIYAMA.

Genus **Nipponaphis** PERGANDE

1906, *Nipponaphis* PERGANDE Ent. News, Philad. P. 205; 1917, MATSUMURA, A Coll. essays f. Y. NAWA, P, 54; 1918, ESSIG and KUWANA, Proc, of the Cal. Aead. of Sci. V. VIII, N, 3; 1929, MONZEN Saito Ho-on kai, Monog. N. 1.; 1930, BOERNER, Archiv f. Klassif. u. Phylog. Ent. B. 1. H. 2; 1934, MONZEN. Bull. of Sci. Res. Alm. Ass. of Morioka Coll. Agri. and Forest., V. 9.

1920, *Astegopteryx* KARSCH. BAKER, U. S. A. Dept. of Agric., Bull. N. 826.

1941, *Thoracaphis* VAN DER GOOT, SHINJI, Nippon Gachu Sosetu,

Genus *Nipponaphis* has been erected by PERGANDE as type with *N. distychii* which was sent by KUWANA from Japan. MATSUMURA (1917), ESSIG and KUWANA (1918), BOERNER

(1930), MONZEN (1929, 1934) used PERGANDE's name. But BAKER considered *Nipponaphis* to be a synonym of *Astegopteryx* KARSCH and SHINJI.i also of *Thoracaphis* VAN DER GOOT. However as the present writer already stated in (1934), genus *Nipponaphis* will be distinct from g. *Astegopteryx* on the following points;

1. The stem-mother of *Nipponaphis* has 3-segmented, and the apterous form 4-segmented antennae.
2. The apterous form of the latter has 2 horn-like protuderances at the vertex, but the fromer not.
3. The alate form of the former has four capitate hairs on the tarsi.
4. If *Nipponaphis* (1906) is the synonym with *Thoracaphis* (1918) it should be retained the former genus.

According to the descriptions of *Anoecia karatanei* SASAKI(1) and its gall, I think it belengs to this genus.

Nipponaphis distychii PERGANDE (Pl I, f. 8)

1906, *Nipponaphis distychii* PERGANDE. Ent. News, Philad. P. 205; 1917, MATSUMURA, A coll, essays f. Y. NAWA, P. 55; 1929, MONZEN. Saito Ho-on kai, Monogr. n. 1; 1934, MONZEN, Bull of sci. Res, Alm, Ass. of Morioka Coll. Agric. and Forest, v.9; 1937, Doi, Konchu Kenkyu, v. 1, N. 1.

1918, *Nipponaphis distylii* ESSIG et KUWANA (in part), Proc. Cal. Acad. of Sci. V. VIII. N. 3.

1941, *Thoracaphis distychii* PERG. SHINJI. Nippon Gachu Sosetu.

N. distychii was named as the causal aphids of the Japanese large piriform and leaf galls which considered a migratory aphid from each other of Isu (*Distylium racemosum*) by PERGANDE in 1906, Prof, MATSUMURA (1917) and the present writer (1929, 1934) redescribed on it. *N. distylii* was renamed for *N. distychii* by ESSIG and KUWANA in 1918. But their figure of *N. distylii* will be *N. yanonis* MATS. from the leaf gall of Isu. Therefore I think it is good to retain the specific name of the author, though it will be misspelling.

According to PERGANDE, the important characters of *N. distychii* are as follows; Head narrower than thorax and broader than long. Antennae 5-jointed, 3rd longer than 4th and 5th combined, 4th longer than 5th, annular sensoriae; 3rd 41—44, 4th 20—24, 5th 11—15. Wings pale dusky, blackish along the vein, first 2 veins near by each other, third vein once branched, the furcal very long and narrow, Nectaries represented by pores only, and situated far back, apparently on the sixth abdominal segment. Tail short, broad, semicircular. Last ventral segment notched at middle of posterior edge.

Nipponaphis yanonis MATSUMURA (Pl. I, f, 9.)

1902, *Schizoneura* sp?, SASAKI, Nippon Jumoku-Gaichuhen. v. 3.

(1) *Anoecia Karatanei*, a new gall-producing Aphid; SASAKI, 1936, Proc. Imp. Acad. Tokyo, vol. XII, No. 4. 103.

1917, *Nipponaphis yanonis* MATSUMURA, A Coll. of Essays f. Y. Nawa, P. 56.

1918, *Nipponaphis distylii* PERGANDE, ESSIG and KUWANA, Proc. Cal. Acad. Sci., v. 8 P. 109.

1920, *Nipponaphis distyfoliae* TAKAHASHI, Bull. Brookl. Ent. Soc. v. 15, P. 115.

1924, *Astegopteryx distyfoliae* TAKAHASHI, Aphid. of Formosa, Pt. 2, P. 148, and 1924, Ibid. Pt. 3, P. 117.

1929, *Nipponaphis yanonis* MATS., MONZEN, Saito Ho-on Kai, Ann. Rep. of work, N. 5. P. 335. and 1934, Bull. of Sci. Res. of Alum. Ass. of Morioka Col. of Agric. and Forest., v. 9., 1937, DOI, Konchu Kenkyu, v. 1, n. 1.

1931, *Thoracaphis distyliifoliae* TAKAHASHI, Aphid. of Formosa, Pt. 6, P. 89.

1941, *Thoracaphis yanonis* MATS., SHINJI, Nippon Gachu Sosetu.

This species produces a leaf swelling on the leaf of *Distylium rasemosum* in Spring, and the alate viviparous female (migrant) fly off therefrom. TAKAHASHI stated that, the summer hosts of this species are *Quercus glandulifera*, *Q. dentata* and *Q. crispula*, and the miglants develope the aleyrodiforms. I found the many alate sexuparous femals and sexuals on the undersides of the leaves of *D. rasemosum* at Anjyo, Aichi Prefecture, in October.

Nipponaphis cuspidatae ESSIG et KUWANA

1918, *Nipponaphis cuspidatae* ESSIG et KUWANA, Proc. of the Calif. Acad. of Sci., 4 ser. V. VIII, N. 3.

1923, *Astegopteryx cuspidatae* ESSIG et KUWANA. TAKAHASHI, Aphid. Formosa, Pt. II, P. 149.

1941, *Thoracaphis cuspidatae* ESSIG et KUWANA, SHINJI. Nippon Gachu Sosetu.

This species has been described on the winged viviparous female and aleyrodiform parasitizing on the twig of Shii (*Castanopsis cuspidata*) by ESSIG and KUWANA. It was collected May 12, 1913 in Tokyo. Though the species was considered to be *Astepteryx* by TAKAHASHI or *Thoracaphis* by SHINJI, the winged viviparous female is very similar to the winged sexuparous female of *Nipponaphis distychii*.

Nipponaphis distyliicola MONZEN (Pl. I, f. 6)

1934, *Nipponaphis distyliicola* MONZEN, Bull. of the Sci. Res. of Alum. Ass. of Morioka. Coll. of Agric. and Forest., V. 9.

This species was described on the causal aphid of the intermediate oblong gall producing on the twig of Isu (*Distylium racemosum*,) in Aichi Prefec. It differs from *N. distychii* PERGANDE in the following points:

1. The alate form of this species is smaller than the latter.
2. The annular sensoriae of the antennae are less numerous than the latter's

	III	IV	V
N. distyliicola	24—32	11—17	10—14
N. distychii	41—44	20—24	11—15

3. The furcal on M_1 of the fore wiug is not long and narrow as in that of the latter.
4. The hooklet of the hind wing 2—3, and that of the latter 4—5.
5. The wing of the latter species fuscous and darker along the veins.

Dr. TAKAHASHI stated that *Nipponaphis cuspidatae* ESSIG et KUWANA may be identieal with *N. distyliicola* MONZEN in 1935. Comparing with the both, *N. cuspidatae* is smaller, and the costal border and the base of the wing fuscous with rather long furcal. Such characters of wing resemble to *N. distychii* than that of *N. distyliicola*, and the latter species was not yet recorded from Tokyo.

Nipponaphis globuli MONZEN Pl. I. f. 7

1934, *Nipponaphis globuli* MONZEN, Bull. of the Sci Res of Alum. Ass. of Morioka Coll of Agric. and Forest., V. 9.

1941, *Thoracaphis globuli* MONZEN, SHINJI, Nippon Gachu Sosetu

This species emerged from the small spherical gall on the twig of *Distylium racemosum* in Aichi and Wakayama Prefectures. Though the life-history of this species was not yet known, the aphids received 2 times in June and October from mr. KASHIYAMA in Wakayama. According to Dr. SHINJI this gall produces 2 times every year in Miyasaki prefecture.

Genus **Astegopteryx** KARSCH

1890, *Astegopteryx* KARSCH, Ber. deutsch. Botan. Ges., B. 8. H. 2; 1910, SASAKI,(2) Ier. Congr. intern. Ent., Bruxelles, P. 449; 1917, MATSUMURA,(3) A Coll. Essays f. Y. Nawa, P. 49; 1920, BAKER, U. S. Dept. Agric., Bull. 826; 1930, BÖRNER, Archiv. f. Klassif. u. Phylog. Ent., S.146; 1934, MONZEN(6), Bull, of Sci. Res. of Alum. Ass. of Morioka Coll. of Agric. and Forest. v.9; 1936, TAKAHASHI,(1) The Proc. of Roy. Ent. Soc. of London, ser B. V. 5. Pt. 5; 1941, SHINJI. Nippon Gachu Sosetu.

Genus *Astegopteryx* has been erected by KARSCH with *A. styracophila* as the type. The aphids of the genus, produce in general remarkable galls on *Styrax* in oriental countries. Dr. TAKAHASHI(1) reported 15 species belonging to this genus. In Japan *A. nekoashi* SASAKI(2) and *A. styraci* MATSUMURA(3) are well known species. TAKAHASHI(4) described *A. takenouchii* Producing gall on *Styrax* sp. from Oita Prefecture and Shinji(5) stated also A. *pseudostyracophila* on *Styrax japonica* from Aomori and Iwate.

The life-history of the aphid belonging to genus *Astegopteryx* would not yet worked out throughly. The present writer(6) described the aleyrodiform considered hibernating forms of *A. nekoashi* and *A. styraci* which have collected on the twigs and branches of each gall bearing tree. TAKAHASHI(7) identifying the aleyrodiform of the former one to be a pupa case of aleyrodid, named it *Dialeurodes styraci*. There are many species of aphids

(4) 1934, TAKAHASHI, Mushi, v. 7, n. 2, P. 68,

(5) 1936, SHINJI, The Zool. Mag., v. 48, n. 2,

(7) 1934, TAKAHASHI, Konchu, v. 8. n. 4—6.

developing aleyrodiform or coccidiform in their life cycles. His pupa case *Aleurolobus styraci*[9] from *Styrax* differs from the named aleyrodiform of *Astegopteryx nekoashi*.

Genus **Schlechtendalia** LICHTENSTEIN

1848, *Aphis chinensis* BELL, Pharm. Jour., Ⅶ, P. 310.

1883, *Schlechtendalia chinensis* LICHTENSTEIN, Stett. Ent. Zeit.: 1917, MATSUMURA,[1] Coll. Essays for Y. Nawa, P. 61: 1929, TAKAHASHI, Trans. Nat. Hist. Soc. Formosa, XIX, P. 529 ; 1929, MONZEN.[3] Saito Ho-on kai, Monogr. no. 1; 1934, TAKAGI,[6] Bull. of Forest Exp. Sta., Keijo, no. 26.

1917, *Melaphis*, BAKER,[2] Ent, News, XXⅧ, P. 383; 1930, BÖRNER. Beitr. zu neuen System d. Blattläuse B. 1 H. 2; 1930, TAKAHASHI. Aphididae Fosmosa, Pt. 6, P. 103; 1941, SHINJI, Nippon Gachu Sosetu.

Genus *Schlechtendalia* was erected with *Aphis chinensis* Bell as type by *Lichitenstein* in 1883. Dr. MATSUMURA[1] described 3 new species; *S. miyabei*, *S. mimifushi* *S. intermedia* from Japan in 1917. In the same year Dr. BAKER[2] stated that this genus was a synonym of *Melaphis* WALSH, and BÖRNER, TAKAHASHI[8] and SHINJI used this name in their papers. However the present writer[3] mentioned that genus *Schlechtendalia* was distinct from the latter, because its special reticulated antennal character in 1929. Afterwards I[4] reported an aleyrodiform which was considered the hibernating form of this genus in 1934. Dr. TAKAGI[5][6]studying on *S. ehincnsis* in detail, he found that is a migratorv aphid, migrating from sumach (*Rhus javanica*) to chiyo chingoke (*Mnium* sp.)[7].and considered that the aphids producing the large oblong so-called chinese gall on the leaf of Rhus in China, Korea, formosa[8] and Japan, are the same species *Schlechtendalia chinensis* FELL. But the present writer consideres that there may be probabely the rather different species living parallelism with migratory life and aleyrodiform.

Explanation of Figures.

Plate I :

1. The curled leaves of *Betula Taushii* (Shirakaba) by *Hamamelistes shirakabae*.
2. The cocks comb-like leaf galls of *Betula Maximowicziana* (Udaikaba) by *H. cristafoliae*.
3. The curled leaf of *Betula grossa* (Azusa) by *H. gibberi grossae*.
4. The warty leaf of *Betula ermanii communis* (Dakekaba) by *H. gibberi*.
5. The warty pouch gall of *Quadrartus yoshinomiyai* on *Distylium racemosum*

(4) 1934, MONZEN. Bull. of sci. Res. of Alum. Ass. of Morioka Coll. of Agric. and Forest. vol. 9.

(5) 1934, TAKAGI, Nurude mimifusi no Chukanki-shu ni tuite.

(7) 1937, TAKAGI, The Secondary host of S. chinensis; *Mnium vesicatum*, *M. trichomanes*, *M. microphyllum*, *M, sapporense*.

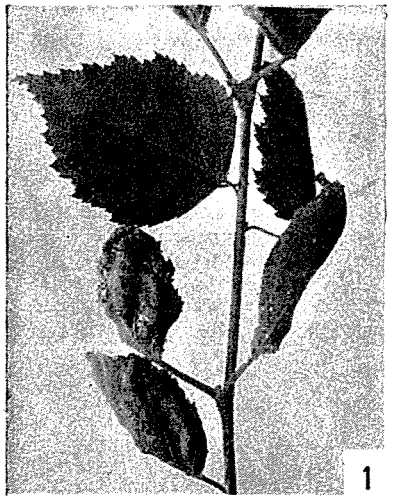
(8) 1938, TAKAHASHI, Taiwan-san fusi ni tuite.

(9) 1954, Takahashi, Kontyu, Vol. 20, Nos. 3—4.

6. The oblong gall of *Nipponaphis distyliicola* on *D. racemosum.*
7. The spherical galls of *N. globuli* on *D. racemosum.*
8. The large gall of *N. distychii* on *D. racemosum.*
9. The leaf galls of *N. yanonis* on *D. racemosum.*
10. The spiny bud gall of *Mansakia miyabei* on *Hamamelis japonica.*
11. The warty pouch galls of *M. kagamii* on *H. japonica.*
12. The conical leaf galls of *M. gallifoliae* on *H. japonica.*

Plate II :

1. The dorsal view of the coccidiform of *Hamamelistes shirakabae.*
2. The ventral view of 〃 〃 〃
3. The cauda and anal plate of the alate form of *H. shirakabae.*
4. The same parts of *H. gibberi.*
5. The same parts of *H. gibberi grossae.*
6. The Stem mother of *H. cristafoliae.*
7. The antenna of the same form of *H. cristafoliae.*
8. The fore leg of 〃 〃
9. The middle leg of 〃 〃
10. The hind leg of 〃 〃
11. The cauda and anal plate of the alate form of *H. cristafoliae.*
12. The same parts of the stem mother of the same species.
13. The wings of *H. cristafoliae.*
14. The wings of *H. gibberi.*
15. The wings of *H. gibberi grossae.*
16. The Antenna of the alate form of *Quadrartus yoshinomiyai*
17. The Antenna of the stem mother of the same species.
18. The cauda and anal plate of the alate form of the same species.
19. The wings of the same form of the same species.
20. The cornicle of the same form 〃
21. The wings of *Mansakia miyabei.*
22. The cauda and anal plate of the same species.
23. The same parts of the alate form of *Mansakia kagamii.*
24. The same parts of the same form of *M. gallifoliae.*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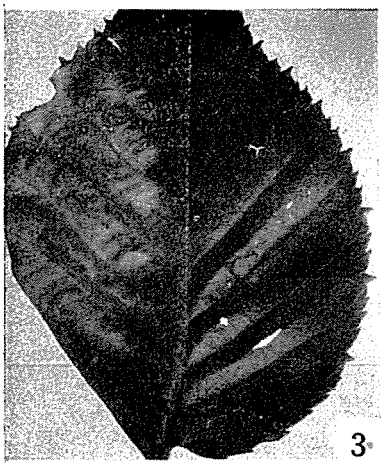
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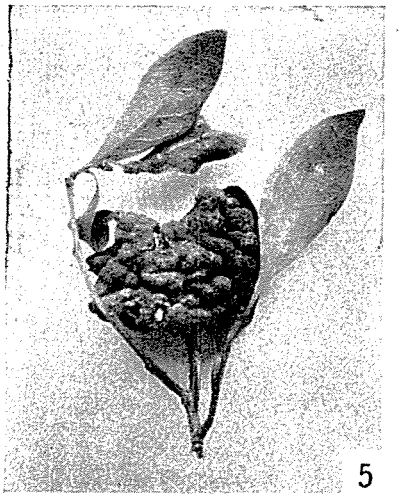
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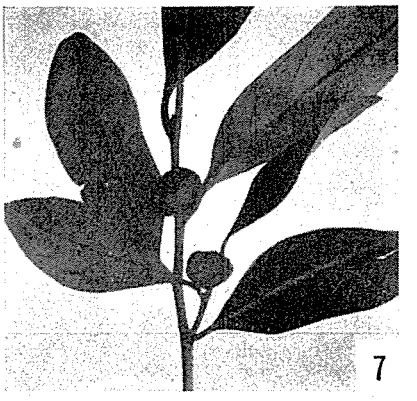
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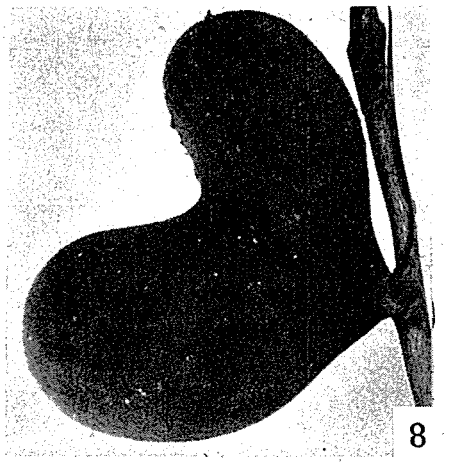
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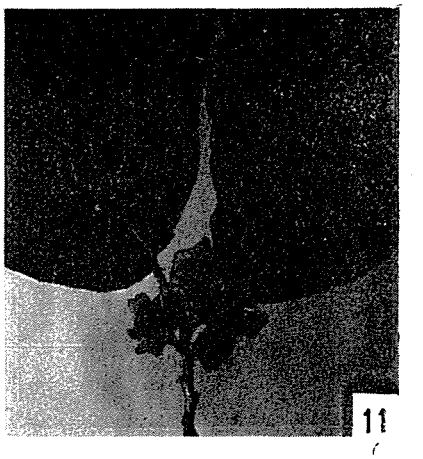
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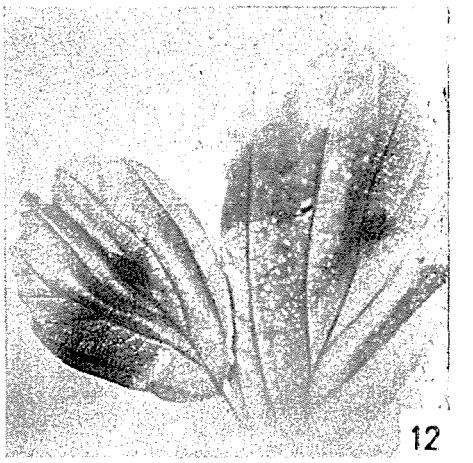
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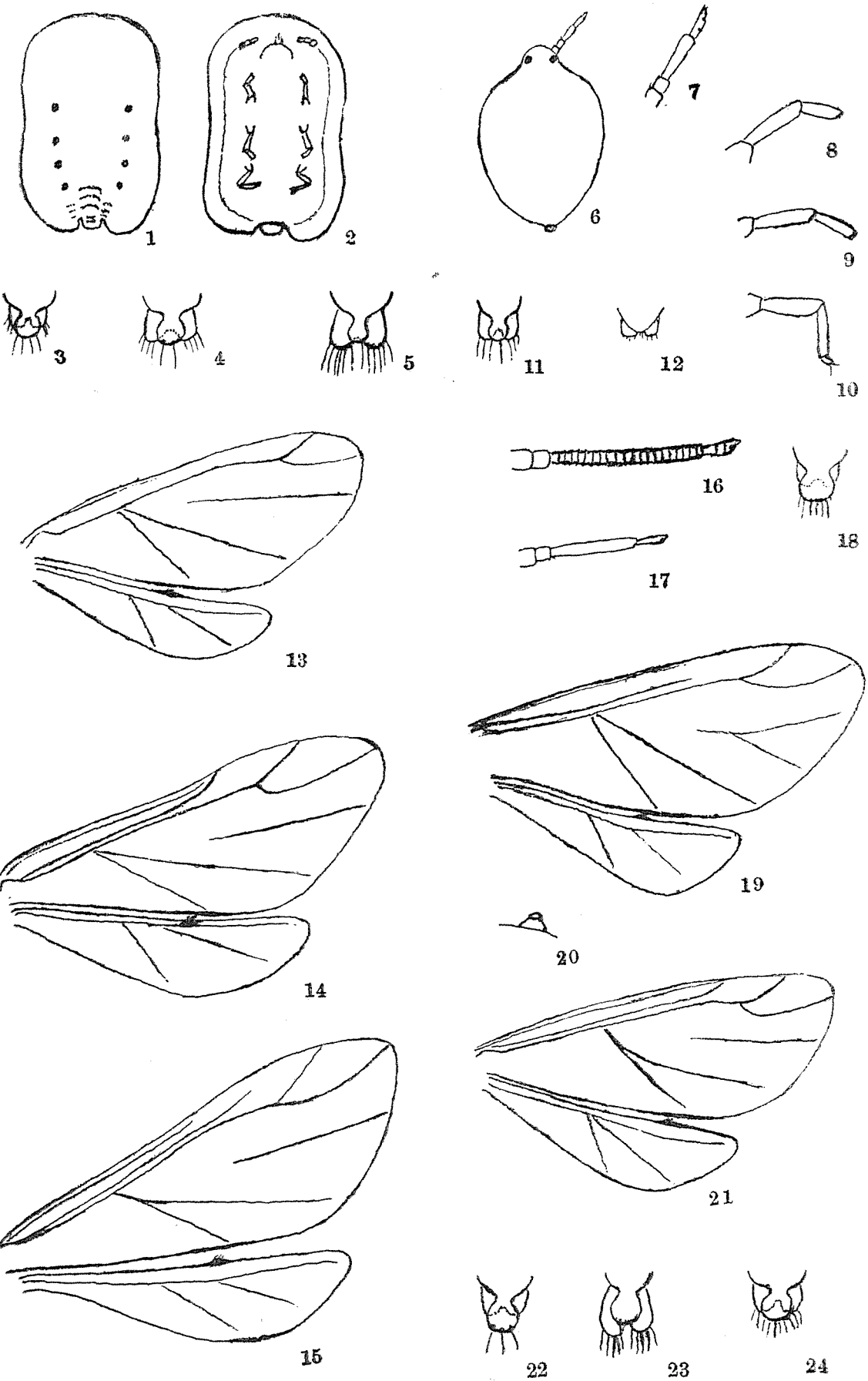
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