

SYSTEMATIC STUDIES OF THE GENUS HYBOS IN JAPAN: I. NEW SPECIES WITH YELLOWISH LEGS (Diptera, Empididae)

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SYSTEMATIC STUDIES OF THE GENUS *HYBOS* IN JAPAN

I. NEW SPECIES WITH YELLOWISH LEGS (Diptera, Empididae)

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The genus *Hybos* is one of the archaic genera of Empididae and very distinct by reason of its horny proboscis projecting forward or slightly upward, the apically pointed anal cell which is longer than second basal cell, and the only two veins from discal cell.

The genus has an almost world-wide distribution. But it is essentially a tropical or subtropical one and very abundant in the Oriental Region, while only a few species have been recorded from Europe. In the eastern Asia, however, the genus spread a long way north, and the home of this genus entirely covers Japan. Up to present the genus is represented only two known species in Japan, but there are more than twenty Japanese species in the author's cabinets. Of these species the author describes four species with more or less yellowish legs.

The most species of this genus fly in the early summer to autumn, in such hot season three major Empid genera, *Empis*, *Rhamphomyia* and *Hilara*, are generally disappeared in Japan.

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Hybos (s. str.) *aurifer* Saigusa, sp. nov.

(Fig. 1, ♂ genitalia)

Small-sized species with golden prescutellar depression, almost entirely yellow legs and hind femora armed beneath with long black spiny bristles.

♂. Compound eyes reddish, touching throughout frons, upper half of eyes more or less flattened, there facets conspicuously enlarged and almost as large as an ocellus. Occiput and small face greyish black, the former with a postocular ciliation of black curved hairs above, and beneath

with scattered yellowish hairs. Antennae with two basal segments greyish, fused together, globular and bearing dark hairs; 3rd segment oval and brown, but yellowish at the extreme base and with a long terminal arista distinctly pubescent for basal four-fifths, then quite bare: Palpi slender, brown, slightly exceeding frons; proboscis brownish and projecting forward or slightly pointing upward.

Thorax black, thinly covered all over with yellowish pollen but pre-scutellar depression brilliantly shining golden; scutellum and postalar calli yellowish brown, the former clothed with yellowish pollen. Chaetotaxy: hairs or bristles on thorax yellow, acrostichals and dorsocentrals fine and scanty, the former irregularly biserial, but scattering in front and ending behind in a pair of long bristles before prescutellar depression, latter uniserial and ending in a strong bristle longer than the longest acrostichal bristle; sides of mesoscutum sparsely clothed with short yellow hairs in addition to one postalar and two notopleural bristles; scutellum

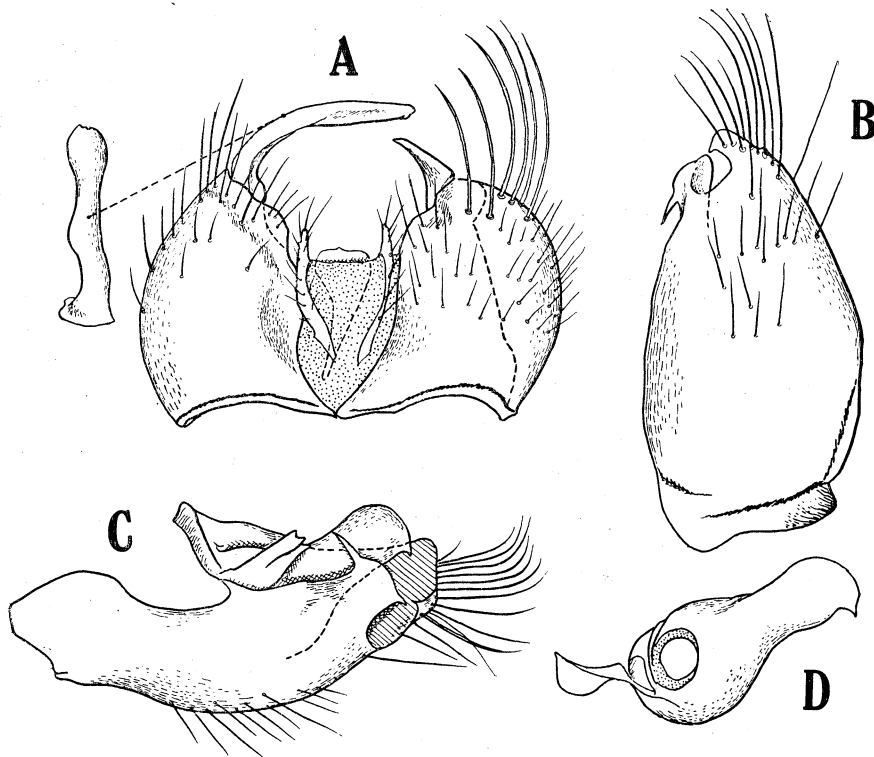


Fig. 1. Male genitalia of *Hybos aurifer* Saigusa, sp. nov.

- A. Epandrium and cerci, dorsal aspect.
- B. Hypandrium, ventral aspect.
- C. Aedeagus and hypandrium, lateral aspect.
- D. Aedeagus, dorsal aspect.

bearing a pair of very long bristles and several weaker hairs; pronotum with a circle of short hairs, but propleura and sternum bare.

Legs including coxae entirely yellow except for brownish hind knee and three apical tarsomeres of all legs; pubescence of legs all yellow to yellowish brown, bristles black except for several weaker yellowish ones; front and middle coxae short-haired, hind coxae with long hairs; front and middle femora simple without prominent bristles; hind femora considerably swollen, nearly 1.5 times as broad as hind tibia at middle, bearing two ventral rows of 12-13 long spiny bristles, the bristles of anteroventral row as long as or a little longer than femur is thick, four strong anterodorsal bristles on apical half, and 1-4 posterior bristles on apical one-third of femora; front tibiae with a dorsal bristle at middle and an anterior one near tip; middle tibiae with two dorsal, one ventral and some apical or preapical bristles, the longer dorsal one situated before middle and as long as half length of tibia, the shorter dorsal one at subbasal portion, the ventral one at middle and three- to four-fifths as long as tibia, the posterior preapical bristles brownish, the ventral pair of apical bristles long and black; hind tibiae almost straight but slightly dilating apically, without a ventral ridge, and bearing a black anterodorsal bristle one-third as long as tibia and situated at middle, a shorter yellowish posterodorsal bristle at preapical portion and a pair of apical bristles of which posterior one is yellowish; front and middle tarsi long and slender, with a brownish ventral bristles at base; middle metatarsi with two prominent black bristles beneath, of which one is at base and another at middle; hind tarsi rather shorter and stouter, metatarsi with several ventral spines.

Wings slightly tinged yellow, with tawny veins; costal ciliation fairly long on basal half; faint A_1 bisinuate; axillary incision nearly 110° , axillary lobe well developed; stigma pale brown, and extending near tip of R_{2+3} . Squama with yellowish fringe. Halteres entirely yellow.

Abdomen brownish black, slightly dulled by a coating of brownish pollen; pubescence of abdomen yellow, longer on sterna and hind-margin of terga. Genitalia: side lobes of epandrium of the same size, left-hand one with a short pointed process, right one with a long curved process which is rather compressed and bluntly ended; cerci small and slender; hypandrium large and asymmetrical, apical portion bifid, left-hand process being bird's head in shape, right-hand process broad and blunt; aedeagus short with basal half swollen and a circular patch on upperside.

♀. Resembling male, but hind femora distinctly narrower than in male, with only one row of ventral spiny bristles, a posterodorsal bristle at preapical portion, and a fine posterodorsal bristly hair at middle; hind tibiae without a posterodorsal brownish bristle.

Length: Body 3.5-4.5 mm; wings 3.4-4.1 mm.

Distribution: Japan (Hokkaido, Honshu and Kyushu).

Types: Holotype ♂, Kanayama, Sudama, Yamanashi Pref., Honshu, 11. VIII. 1961, T. Saigusa leg. Paratypes 21 ♂♂ 14 ♀♀, same data as holotype; 5 ♂♂ 4 ♀♀, Kiyokawa, Ashoro, Tokachi, Hokkaido, 30. VII. 1962, T. Saigusa leg.; 4 ♂♂ 10 ♀♀, Hosshō-onsen, Mt. Kujū-san, Ōita Pref., Kyushu, 23. VIII. 1962, T. Shirōzu leg. The types are now in the author's collection.

This new species is easily distinguished from the other yellow-legged *Hybos* by the golden prescutellar depression.

Hybos (s. str.) *bicoloripes* Saigusa, sp. nov.

Small- or medium-sized species with yellow legs except for hind femora which are black and paled at base and tip.

♂. Compound eyes continuous on upper two-thirds of frons and with all facets subequal in size. Small triangular frons and narrow face dark grey, ocellar tubercle with a pair of proclinate long black bristles; occiput blackish grey, with black curved bristly hairs arranged in two rows above, several similar hairs scattered below neck, and brownish hairs near oral margin. Antennae dark brown, basal segments more or less fused, 2nd segment globular, broader than 3rd and bearing a circlet of dark setulae; 3rd segment oval, as long as two basal segments together and with a long blackish arista, which is sparsely clothed with short pubescence except for short apical portion. Palpi black and slender, projecting forward and bearing 3-4 shortish dark bristles on ventral side; proboscis parallel to palpi, dark brown, its apical portion without minute hairs.

Thorax black, rather densely covered all over with yellowish pollen, but the ground color not entirely concealed by it. Chaetotaxy: hairs or bristles all yellowish brown to brown except for hindmost pair of dorsocentrals; 5-7 pairs of acrostichals, of which one pair before prescutellar depression is longest and dark brown, a few pale hairs on prescutellar depression; 7-8 dorsocentrals longer behind, hindmost black, bristly and distinctly longer than the other bristles on disc of mesoscutum; 4-5 weak humeral, several intrahumeral, 4-5 posthumeral in a row, two strong notopleural, 5-6 weak supra-alar bristlers in a row and one strong postalar bristle; two pairs of scutellar bristles with several scattered weak hairs, inner bristles close together, outer pair often becoming hair-like; pronotum with a circlet of blackish setulae.

Legs including coxae entirely yellow except for dark hind knee and hind femur which is coloured black leaving yellowish apical and basal one-quarter; apical 1-2 tarsomeres usually darkened. Coxae clothed with longish yellow hairs; front femora somewhat swollen, with yellowish hairs beneath and behind, short dark hairs in front; middle femora slender, densely clothed with long yellowish hairs except shorter-haired

dorsal side, and bearing 2-4 dark bristly hairs on apical half in front; hind femora considerably swollen, entirely clothed with long yellow hairs, and with an anterodorsal row of several black bristly hairs on apical half, bearing many black spines beneath which are shorter than diameter of femur and arranged in two rows; hind trochanters yellow, but ventral portion infuscated and armed with some short spines; front tibiae with long yellow hairs except in front, there covered with minute golden recumbent pile, a long dark stiff hairs at one-third from tip; middle tibiae slender, entirely clothed with long yellowish hairs, bearing two black anterodorsal bristles, one at subbasal portion, another at middle, and three preapical bristles; hind tibiae slender and straight, clothed all over with long yellow hairs; front and middle tarsi slender, metatarsi with long hairs, and with ventral strong setulae; hind pair of tarsi short and stout, short-haired, with two basal segments armed beneath with several short spines.

Wings long and cneiform, tinged yellowish, with yellow veins, and faint yellowish stigma, its apex far before tip of R_{2+3} ; axillary incision more than 140° ; axillary lobe much reduced. Squama with yellow fringe. Halteres entirely yellow.

Abdomen black, terga densely dusted grey except on side patches which are polished and situated on posterior portion of each terga, but on 1st tergum situated in front; sterna and sides of terga sparsely clothed with tawny hairs, hind-marginal hairs of terga more or less differentiated. Male genitalia: moderately large without the combs of hairs.

♀. Resembling male, but hind femora with the blackish portion much more reduced and ventral spines weaker.

Length: Body, 3.8—4.3 mm; wings 4.5—5.3 mm.

Distribution: Japan (Honshu).

Types: Holotype ♂, Kitazawa-tôge, Mt. Senjô-dake, Nagano Pref., Honshu, 25. VII. 1961. Paratypes 2 ♂♂ 7 ♀♀, same data as holotype; 2 ♂♂, Kuroyu, Mts. Hachimantai, Akita Pref., Honshu, 9. VII. 1962; 1 ♂ 1 ♀, Mt. Tsubakuro-dake, Nagano Pref., Honshu, 18. VIII. 1962. All the types collected by the author are now preserved in his collection.

This new species is somewhat allied to *annulipes* Frey from Burma, but in this latter species the upper facets of compound eyes are enlarged; antennal arista is naked, the hind femora have a broad blackish brown ring before tip, and the middle tibiae have a very long bristle near middle on inner side. These characters do not agree with this new species.

Hybos (s. str.) *xanthomelas* Saigusa, sp. nov.

Small-sized species with all coxae, front and middle legs yellowish, hind legs black except for yellowish bases of the both femora and tibiae.

♂ & ♀. Compound eyes touching throughout frons, upper facets somewhat enlarged in male, almost of the same as lower ones in female. Small triangular frons above antennal foramina and narrow face silvery; occiput black, thinly dusted grey and with a postocular fringe of fine tawny bristles on upper half and some scattered long whitish hairs below; ocellar prominence with a pair of fine tawny bristles close together. Antennae black, fused basal segments globular, thinly dusted grey and bearing a circlet of short black hairs, apical segment oval, with a terminal arista which is entirely naked and has its apical one-third very much slender. Palpi and proboscis brownish, projecting forward, the former with several short hairs and a short terminal black bristle.

Thorax shining black, but thinly covered with whitish pollen; humeri, postalar calli and pteropleura brownish. Chaetotaxy: thoracic bristles all fine and yellow to yellowish brown; acrostichals and dorsocentrals scanty, very fine and short, the former bi- or triserial, latter uniserial; 1-2 minute humeral, two strong notopleural with 2-3 minute hairs on upper part of notopleural depression, 3-4 minute supra-alar hairs in a row, and one postalar bristle; scutellum with a pair of prominent yellow bristles and several short yellow hairs.

Front and middle legs yellow with infuscated tarsi, hind legs black except for yellow coxa, trochanter and the extreme bases of femur and tibia. Legs entirely clothed with fine short yellow hairs. Front and middle legs slender; front tibiae with several brownish bristles near tip, in male front tibiae with a long yellow preapical hair behind; middle tibiae with a brownish dorsal bristle near base; front tarsi clothed laterally with many long yellow hairs nearly half as long as the metatarsus. Hind femora slender but gently dilated apically, armed anteroventrally with a row of spines each arising from a tubercle, the spines slightly shorter than width of the femur and brownish on basal half, black on apical half of femur; the femora also bearing posteroventrally several stiff yellowish hairs towards tip; hind tibiae considerably incrassate on apical half, with a ventral ridge on basal half, and above with a preapical yellow bristle; hind tarsi short and rather stout.

Wings slightly darkened; stigma pale brown with tip slightly beyond middle of 3rd section of costa; veins all dark brown but A_1 faint and gently bisinuate, axillary incision nearly 130° , axillary lobe weakly developed. Squama and its fringe yellow. Halteres also entirely yellow.

Abdomen shining black, free from pollen except for 1st tergum and anterior margin of 2nd tergum which are thinly covered with pale pollen. Pubescence of abdomen short, yellowish and sparsely distributed, hind-marginal bristles of terga long and prominent at sides. Male genitalia moderately large, with dark hairs, and devoid of the combs of hairs.

Length: Body 3.1—3.5 mm; wings 3.5 mm.

Distribution: Japan (Hokkaido and Honshu).

Types: Holotype ♂, Kiyokawa, Ashoro, Tokachi, Hokkaido, 1. VIII. 1962. Paratypes 1 ♀, same data as holotype; 1 ♀, Nukabira, Shihoro, Tokachi, Hokkaido, 5. VIII. 1962; 1 ♀, Sudama, Kanayama, Yamanashi Pref., Honshu, 11. VIII. 1961; 1 ♀, Kitazawa-tôge, Mt. Senjô-dake in the Akaishi range, Nagano Pref., Honshu, 6. VIII. 1961. All the types were collected by the author, and are now in his collection.

This new species resembles *flavicoxa* Frey from Burma, but in the latter species the hind femora and tibiae are yellowish at tip instead of base, and male genitalia is larger, "etwa doppelt breiter als der schmale Hinterleib."

Hybos (s. str.) *flavipes* Saigusa, sp. nov.

Small-sized species with entirely yellowish legs except for darkened tip of hind femora, and black mesoscutum devoid of a golden patch.

♂. Compound eyes touching for a long space on frons with rather large facets almost of the same size. Small frons and very narrow face grey, ocellar prominence black with a pair of black bristles and a few short hairs; occiput black, thinly dusted grey and bearing a postocular ciliation of curved brownish bristles on upper half, and several yellowish fine hairs on lower half. Antennae as in *xanthomelas* Saigusa, but an arista very short-pubescent on basal two-thirds. Palpi and proboscis brown and projecting forward, the former with a few setulae near tip.

Thorax weakly arched above, black, thinly covered with greyish pollen but shining black about humeri; pleura more densely dusted than nota. Chaetotaxy: biserial acrostichals and uniserial dorsocentrals fairly long and brownish; two fine humeral, 1-2 fine posthumeral, one strong and some weak notopleural, two weak supra-alar, one fine postalar bristles all yellowish brown; scutellum with a pair of approximated yellow bristles and four weak pale setulae.

Legs yellow, apical one-quarter of hind femora and three apical tarsomeres of all legs infuscated. Front and middle legs long and slender, femora clothed with short yellow pubescence and a posteroventral row of long stiff hairs, front femora somewhat swollen; tibiae and tarsi clothed all over with short brownish hairs, lateral hairs of metatarsi longish; middle tibiae bearing two brownish dorsal bristles which are as long as half length of the tibia, basal one situated near base and apical one after middle, the tibiae also armed preapically with several yellowish bristles. Hind femora strongly swollen, widest at middle and tapered towards base and tip, evenly clothed with long yellow hairs and bearing many ventral spines, three long anterodorsal brownish bristles on apical two-thirds, and a number of posteroventral stiff hairs; hind tibiae straight and of the same width throughout, clothed with long tawny pubescence and with a posterodorsal dark bristle at base, a slightly raised ridge

beneath on basal one-third, about this ridge the tibiae more or less darkened.

Wings slightly infuscated; stigma faint, veins pale brown, A_1 weak and straight; axillary incision nearly 140° , axillary lobe much reduced. Squama and its fringe yellow. Halteres yellow with a slightly darkened shaft.

Abdomen black, weakly covered with greyish pollen leaving shining side patches on each tergum. Pubescence of abdomen scanty and yellowish, longer on lateral portions and hind-margin of tergum. Male genitalia moderately large, not projecting above and beneath the level of abdomen, with hypandrium distinctly produced posteriorly beyond the tip of epan-drium.

Length: Body 3.2 mm; wings 3.9 mm.

♀. Much resembling male, but hind femora slenderer, with weaker ventral spines or bristles few in number.

Length: Body 2.7 mm; wings 3.3 mm.

Distribution: Japan (Honshu).

Types: Holotype ♂ and paratype 1 ♀, Oirase, Towada, Aomori Pref., Honshu, 14. VII. 1962, T. Saigusa leg. The types are now in the author's collection.

This new species very closely resembles *apicalis* Frey from Burma, but this latter species has blackish scutellar bristles.