

*Melanagromyza lappivora*, a new species of root miner  
of Burdock in Japan (Diptera, Agromyzidae).

(Taxonomy and bionomics of Dipterous pests for farm and garden in Japan. III)

Kenji KOIZUMI

ゴボウネモグリバエ *Melanagromyza lappivora* sp. n. について

(双翅目農園芸害虫の分類及び生活史の研究 第3報)

小 泉 憲 治

Recently, Mr. Muto of the Gifu Agric. Exp. Sta. observed that the edible roots of Burdock "Gobō" (*Arctium lappa* L.) cultivated in Gifu district were severely injured by the larvae of an Agromyzid fly. This is apparently a new pest of Burdock and its bionomics and control measures are being studied by him.

After examination of the specimens which received from Mr. Muto, I came to the conclusion that this Agromyzid is undescribed form. The present paper deals with the taxonomical study of this fly. The terminology used here are taken from Dr. Frick (1952) with minor exceptions.

I wish to express here my sincere thanks to Mr. Toshiro Muto of the Gifu Agricultural Experiment Station for the gift of the specimens, and also to Prof. Dr. Chukichi Harukawa of the Okayama University for his kindness in reading through this manuscript.

***Melanagromyza lappivora* sp. nov.**

This is a somewhat interesting species in several features. In adult the aedeagal hood sclerotized very weakly, pregonites small. In larva the body is extremely slender like the cambium miners in *Phytobia*, about 16 times as long as wide; mandible has, wing like, large triangular plates on basal part; left mandible being larger than the right in opposition to the usual type.

**Male** : Body, 2.4 mm. in length; wing, 2.3 mm. in length. Body shining black, without any dusting, and lacking in greenish lustre. Wings hyaline; calypters pale black with deep black fringes; halteres black.

Head (Fig. 1.) : front at above (at the line on anterior ocellus) about 1.6 times as wide as an eye, its lateral sides almost parallel and only slightly converging below, at base of antennae about 1.4 times as wide as an eye, somewhat longer than width ; genovertical plates prominent,  $1/4$  the width of frontal vitta, broadened forward, near lunule the width 1.2 times as wide as above ; ocellar triangle extending anteriorly to the level of upper *sfo*, postocellar line about  $1/4$  as wide as front ; lunule semicircular, height  $1/2$  the width of its base,  $1/2$  the height of face, its width of base  $2/3$  the distance of eyes, height  $1/4$  the distance between anterior ocellus and base of antennae. Face : antennal grooves rather deep, mesofacial plate somewhat convex, epistoma flat. In profile (Fig. 1.) front and face visible, gena broad, at vibrissa  $1/6$  eye height, about  $1/3$  at posterior angle, anterior angle of subcranial margin normal, not produced forward. Setal pattern of head : 2 *sfo*, upper *sfo* directed dorsally, lower *sfo* dorsally and somewhat inward ; 2 *ifo*, upper *ifo* directed dorsally and inward, lower *ifo* inward and touching each other at the tip ; *os* directed dorsally, arranged from upper *sfo* down to beyond lower *ifo*, sparse on upper part and dense on lower ; *oc* anteriorly beyond lower *sfo* ; *pvst*, *vti*, *vte* setae strong ; 4—5 long setae on subcranial margin, almost as long as vibrissa. Antennae somewhat diversing from one another, in profile located far below the level of middle of eye, third segment subspherical, in diameter about  $1/4$  the eye height, arista nearly 4 times as long as diameter of third segment, setulose. Proboscis not elongated ; palpi normal.

Thorax : 2+0 *dc*, 2nd *dc* before the line between each *sa* ; *acr* 8 rows at level of paired 2nd *dc* and 6 rows at level of paired 1st *dc*, 3 rows between *dc* and *ia* ; 1 *sa* ; 1 *ia* ; 0 *prsc* ; 2 *pa*, inner minute. Pleurae ; humeri with 5—6 setulae plus strong 1 *h* ; 1 *pp* ; 2 *npl*, posterior almost half as long as anterior seta ; anepisternum with 7—8 minute setulae on the diagonal line from upper anterior angle to lower posterior angle, 1 *aes* plus 3 setulae on posterior margin ; katepisternum with 2 setulae on dorsal margin plus 1 *kes*.

Wings (Fig. 2.) : about 2.2 times as long as broad ; costa reaching  $m_{1+2}$ , wing tip situated between  $r_{4+5}$  and  $m_{1+2}$  but nearer  $r_{4+5}$  ; costal ratio II : III : IV = 5.6 : 1.3 : 1 ; cross vein *r-m* situated just beyond the termination of  $r_1$  in costa and on discal cell far behind the middle, about  $1/3$  length of  $m-m$  ; ultimate section of  $r_{4+5}$  nearly 3 times as long as penultimate, ultimate section of  $m_{3+4}$  about  $2/3$  of penultimate.

Legs : mid-tibiae without distinct bristles on posterior surface near the middle.

Abdomen : ovoid, dorsally with numerous short setae, marginal setae long and sparse ; sixth tergite longer than fifth.

Male terminalia (Fig. 3—5) : aedeagal apodeme long, anteriorly extending to anterior

margin of fourth segment, posteriorly extending far within ninth tergite; epiphallus small, about  $1/12$  length of aedeagal apodeme; aedeagal hood broad but sclerotized weakly, bearing many minute spines dorsally, about  $1/7$  length of aedeagal apodeme; phallopore closely united to aedeagal apodeme, about  $1/9$  length of aedeagal apodeme; phallus rounded, about  $2/3$  length of ninth sternite; basal section sclerotized, about  $1/4$  length of phallus, each pair of sclerites united dorsally at basal part and anteriorly somewhat produced ventrally; median section moderately sclerotized, about  $2/3$  length of phallus, ventral plates covered with minute spines, dorsal plates doubled back dorsally to form a thickened complex with ventral plates; distal section entirely membranous, about  $1/3$  length of phallus, somewhat curved dorsally, terminating in tube; ninth sternite about  $3/4$  length of aedeagal apodeme, triangular, posterior one-third turned ventrally, sidepieces broad; hypandrial apodeme distinct, about  $1/3$  length of ninth sternite, anterior one-third thickened, from laterally this portion formed a triangular plate; pregonites (Fig. 4 B.) separated from ninth sternite, being narrow, flattened plates, on anterior surface bearing six sensory pores with the regular arrangement; postgonites, inner and outer process united. Ninth tergite (Fig. 5 A) about  $1/2$  as long as height, bearing numerous fine setulae; surstyli strongly incurved, approximated

#### EXPLANATION OF PLATE

##### *Melanagromyza lappivora* sp. nov.

ゴボウネモグリバエ

Fig. 1. Head in profile.

Fig. 2. Wing.

Fig. 3. Male terminalia, lateral view (Ninth tergite removed).

Fig. 4. A). Male terminalia, ventral view (Ninth tergite removed).

B). Pregonite, ventral view.

Fig. 5. A). Ninth tergite, lateral view.

B). Cerci, dorsal view.

Fig. 6. Larva, lateral view (The solid line represents 1.5 mm.).

Fig. 7. A). Cephalopharyngeal sclerite, lateral view.

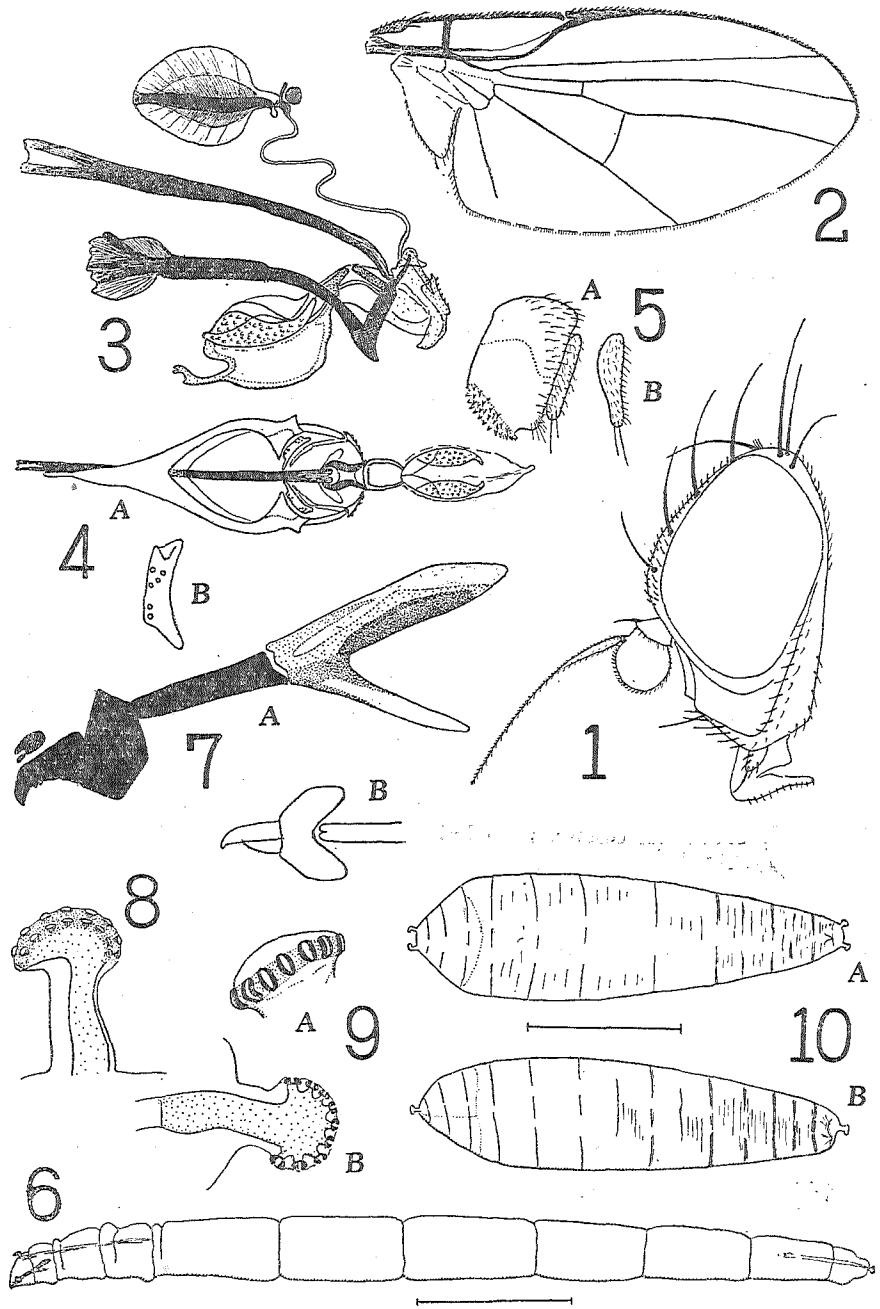
B) Mandible, ventral view.

Fig. 8. Anterior spiracle, lateral view.

Fig. 9. Posterior spiracle. A). dorsal view. B). lateral view.

Fig. 10. Puparium (The solid line represents 1.5 mm.).

A). dorsal view. B). lateral view.



centrally, bearing numerous small, sharp spines on entire ventral margin; cerci (Fig. 5 B) moderately flattened,  $1/2$  height of ninth tergite, about  $1/4$  as wide as long, bearing numerous fine setulae, 2 or 3 long setae ventrally. Ejaculatory apodeme large, about  $1/3$  length of aedeagal apodeme, strongly broadened symmetrically to the both sides in the plane of blade, but shape of blade are somewhat variable in specimens; bulb with two round wings.

**Female** : Body, 3 mm. in length; wing, 2.8 mm. in length. Similar to male in general features and colouration, seventh abdominal segment conical somewhat shorter than sixth segment, shining black.

**Larva** (Fig. 6—9) : creamy white, very slender, 7.8—3 mm. in length, 0.5—0.7 mm. in width, being 14—16 times as long as wide.

**Head** : cephalopharyngeal sclerites (Fig. 7) about 0.7 mm. in length; mandible one large terminal tooth on each, and two very minute notches on its basal part, usually left mandible is larger than the right, at base of mandible with very large, wing like, triangular plates, these plates being united ventrally and spread dorsally on either side of mandible; labial sclerite completely separated from paraclypeal phragma, nearly uniform in width; paraclypeal phragma slender, rather weakly sclerotized, without anterior projecting spine; dorsal process slender, dorsal and ventral arms visibly united; ventral process very weak, being half the length of dorsal process; mandibular abductor apodeme well developed; longitudinal sclerite inconspicuous.

**Body** : anterior spiracles (Fig. 8), apart from one another, about 0.06 mm. raised up, foot shaped, brown in colour, nine bulbs in two rows; posterior spiracles (Fig. 9) separated from each other, projecting about 0.06 mm. to backward, dark brown in colour, with short stalk bearing a disc, around the margin of which nine bulbs are arranged in a row; 2—7 abdominal segments elongated abnormally, each segments about the length of three thoracic segments plus 1st abdominal segment, 1st abdominal segment normal, about  $1/3$  the length of 2nd abdominal segment; abdominal cuticular processes quite inconspicuous; posterior end without tubercles.

**Puparium** (Fig. 10) : grey with dark stripes at some places, matt, translucent; cylindrical, 4.2 mm. in length, 1.2 mm. in width at 1st abdominal segment, becoming narrower gradually posteriorly, 1.08 mm. height at 3rd abdominal segment, being lower gradually to posteriorly; each spiracles projecting visibly; in pupation the larvae contact to half the length and so many creases of larval skin are observed at some places on puparium as dark grey stripes.

**Habitat** : Japan (Honshu)

**Holotype** : 1♂ : 15, V, 1953, Gifu, Gifu Pref. **Allotopotype** : 1♀ : 15, V, 1953.

Paratopotypes : 2♂♂ . 2♀♀ : 8—15, V, 1953.

Type-specimens : reared by T. Muto, deposited in the Entomological Laboratory of Okayama University.

This new species comes near to *M. pubescens* Hendel, known from Europe, in general features of adult, but mid-tibiae have no minute spines on posterior surface near the middle, head in profile with gena not so projecting from eye margin as in *pubescens*, antennae somewhat diverging one another.

**Biological notes** : According to Muto and Takahashi<sup>1)-2)</sup>, the adult oviposits her eggs under the epidermis of seed-leaf or base of stalk of the young leaf, the larva mines its way under cortex of root, go downward to top of the root. The full-grown larva crawls up the base of leaf-stalk, and pupate at this part. There are 4—5 generations in the period from May to October, hibernation occurring from October to April in parval stage in the mining tunnel under the cortex of root. The injured burdock root are dwarfed, with many divided futile minute roots, and no fine, slender good roots which are of high commercial value are produced. Now, only the Burdock (*Arctium lappa* L.) is known as the host plant. Spreng or dusting with Folidol at ovipositing or hatching period of eggs, is highly effective for controlling this pest.

Literature relating to the bionomics and control.

(all are written in Japanese)

- 1). Muto, T. and F. Takahashi (1953), On the Burdock root miner *Melanagromyza* sp., a new pest of Burdock in Japan.  
Gifu Agric. Exp. Sta. Ent. Lab. Pub., No. 1. 11 pp., 9 photos. June, 1953  
(Mimeographical printing)
- 2). Muto, T. and F. Takahashi (in press), On the new Burdock pest "Gobo-ne-mogri-bae" (*Melanagromyza* sp. )  
Proceedings of the Meeting of Agricultural Research Workers in Tokai and Kinki,  
No. 3-5. (1951-53).

### 摘 要

近年、岐阜地方で問題となつた、ゴボウの根に潜入加害するゴボウネモグリバエに関し、岐阜農試より送附された標本にもとづき、この分類上の位置並びに形態を明にし、次の新学名を与へた。

*Melanagromyza lappivora* Koizumi