Classification on the agromyzids (Diptera: Agromyzidae) in sunflower fields

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INTRODUCTION

The Agromyzidae family has 39 genera with 3375 species described worldwide, and 21 genera with 169 species were known to occur in China. The flies on sunflowers not only harm the plant tissue, but also may carry bacteria and fungi, and cause potential economic costs.

Table.1 Agromyzids from sunflowers worldwide

Agromyzidae	Host plant part	Agromyzidae	Host plant part
Melanagromyza splendida	Stem, with *Rhizopus oryzae*	*Liriomyza helianthin*	Leaf
Melanagromyza cunctanoides	Stem	*Liriomyza huidobrensis*	Leaf
Melanagromyza minimoides	Seed	*Liriomyza pusilla*	Leaf
Melanagromyza viridis	Seed	*Liriomyza spencerella*	Leaf
Agromyza reptans	Leaf	*Liriomyza sativae*	Leaf
Calycomyza humeralis	Leaf	*Liriomyza trifolii*	Leaf
Calycomyza jucunda	Leaf	*Nemorimyza maculosa*	Leaf
Calycomyza platyptera	Leaf	*Phytomyza horticola*	Leaf

MATERIAL METHODS

Genitalia preparations were made by removing and macerating the apical portion of the abdomen in warm lactic acid for 10–20 min, then rinsing them with purified water for dissection and study. After examination in glycerin, genitalia were transferred and stored in a microvial with glycerin. Specimens were examined with a Nikon 1270 dissection microscope. Adult images were taken with a Nikon DS-Fi3 digital camera and a series of images montaged using Helicon Focus (©HeliconSoft). Genitalia images were taken with DMC6200 digital camera on Leica M205FA dissection microscope a series of images montaged using Leica Application Suite X 5.0.2.24429. All images were further processed with Adobe Photoshop CS 6.0®.

Fig.1 the malaise trap in sunflower fields

Fig.2 Nikon 1270 dissection microscope

RESULTS AND DISCUSSION

The comparative morphology and anatomy were used to classify and identify 8 species of 7 genera of family Agromyzidae. The results are showed that two species *Amauromyza wuyuanensis* sp. nov. and *Ophiomyia neimengguensis* sp. nov. are new to science, and two species *Amauromyza karli* and *Agromyza kincaidi* are newly recorded for China. At present, there are few studies on sunflower miners in China with only three species *Liriomyza sativae*, *Liriomyza trifolii*, *Phytomyza horticola* as sunflower miners.This study aims at providing scientific species data on control of agromyzids in sunflower fields.

Table.2 Agromyzids from the sunflower field of Wuyuan County

genus	species	
Agromyza	*Agromyza kincaidi*	
Melanagromyza	*Melanagromyza provecta*	
Ophiomyia	*Ophiomyia neimengguensis* sp.nov.	
Amauromyza	*Amayromyza wuyuanensis* sp.nov.	*Amauromyza Karli*
Calycomyza	*Calycomyza artemisiae*	
Liriomyza	*Liriomyza bryoniae*	
Phytomyza	*Phytomyza horticola*	

Images of male adult

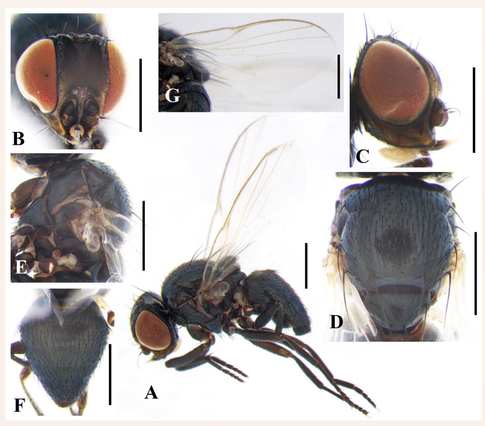

Fig.3 *Ophiomyia neimengguensis* sp. nov.

Diagnosis. Fronto-orbital plate pale brown anteriorly. Vibrissal fasciculus black to yellow. vibrissal angle beyond 60°. Calypter gray, margin and fringe white.

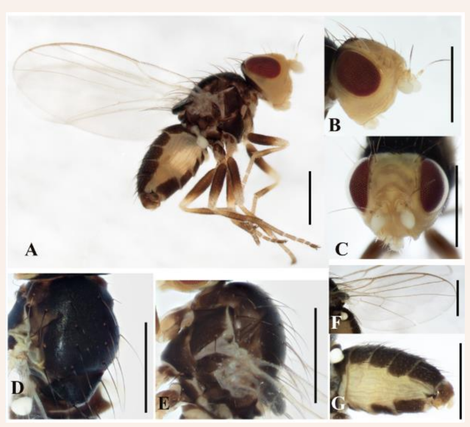

Fig.4 *Amauromyza wuyuanensis* sp. nov.

Diagnosis. Legs yellow to brown with fore coxa light brown, and trochanters, apices of femora (distal more than 1/3) and apices and base of tibiae light yellow.

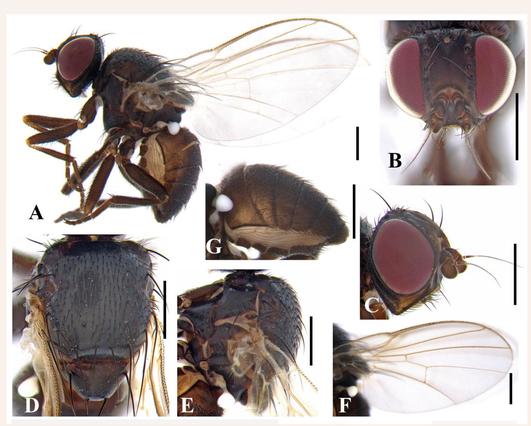

Fig.5 *Agromyza kincaidi* Malloch, 1913.

Diagnosis. First flagellomere small and rounded with small apical tuft of pale hairs. Costa only extending to R_{4+5}.

Fig.6 *Amauromyza karli (Hendel, 1927).*

Diagnosis. Legs mostly brown with fore coxa light brown, trochanters, apices of femora (about a fifth) and apices of coxae light yellow; base of tibiae yellow.

Images of male genitalia

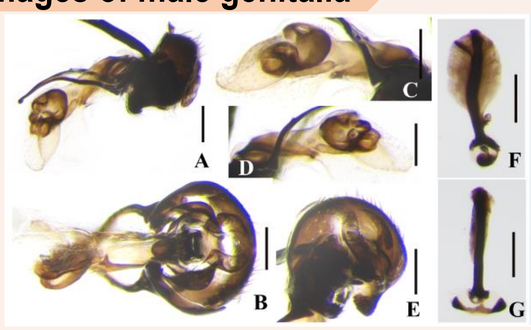

Fig.7 *Ophiomyia neimengguensis* sp. nov.

Diagnosis. Ejaculatory apodeme with dark crooked stalk to apex of blade, and a branch of stalk near apex of blade.

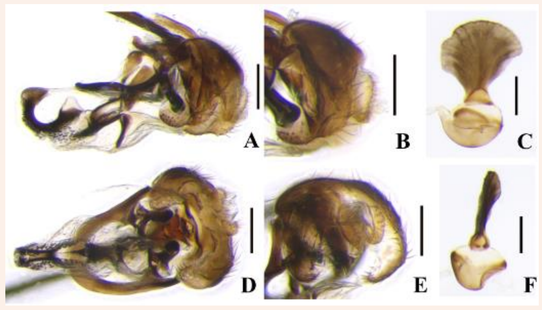

Fig.8 *Amauromyza wuyuanensis* sp. nov.

Diagnosis. Distiphallus closed to C-shape with larger opening, surrounding membrane with black spines ventrally.

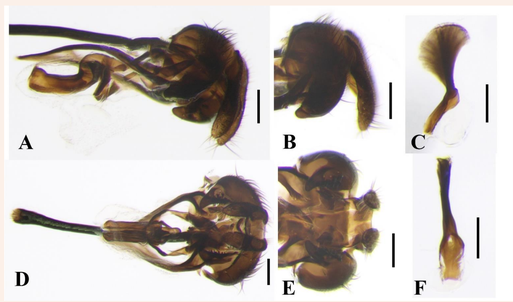

Fig.9 *Agromyza kincaidi* Malloch, 1913.

Diagnosis. Distiphallus capsule-shaped with subbasal opening for entry of ejaculatory duct, pronounced dorsobasal collar

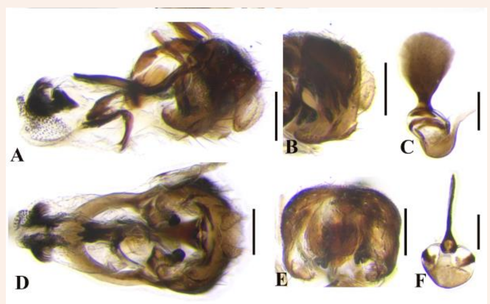

Fig.10 *Amauromyza karli (Hendel, 1927).*

Diagnosis. Distiphallus brownish black, C-sharped from lateral view, with one tuft of setae on one side.

This work was funded by the National Natural Science Foundation of China (No. 32160128).