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SOME LEAF-MINING AGROMYZIDAE (DIPTERA) FROM QUEENSLAND

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Abstract

Some aspects of the occurrence, biology and host relationships of fifteen native and introduced species of *Agromyza*, *Ophiomyia*, *Melanagromyza*, *Phytobia*, *Cerodontha*, *Liriomyza*, *Haplomyza*, *Pseudonapomyza* and *Phytomyza* are discussed.

Subfamily AGROMYZINAE

Agromyza Fallén

One species of this genus was reared, from *Brachiaria miliiformis* (Presl.) Chase. This was accidentally destroyed.

Ophiomyia Braschnikov

One species of this genus is recorded from Queensland, the introduced lantana fly, *Ophiomyia lantanae* (Frogg.).

Melanagromyza Hendel

There are several species of this genus from Queensland. The most important is the bean fly, *M. phaseoli* (Tryon). Although described from Queensland, it has a wide distribution and was probably originally introduced. Five new species of leaf-miners were described from this genus in a recent paper (Kleinschmidt 1960)—*M. wikstroemiae, pisi, polyphyta, indigoferae* and *dianellae. M. wikstroemiae* mines the leaves of *Wikstroemia indica* Endl. a native shrub. Spencer (1963) records it from *Pimelea ligustrina* Labill. but I have so far made no similar records. *M. pisi*, a relatively small fly, is found mining leaves of the garden pea, *Pisum sativum* L. *M. polyphyta* was synonymized by Spencer (1963) with Malloch's *atomella*. The larval mandibles of this species are distinctive from other Queensland species, being broad, and carrying from 4 to 9 serrations. There is a host range of about 30 species. The mine is at first broad, epidermal and linear on the upper leaf surface, becoming parenchymatous in the 3rd larval instar when it can spread to become a blotch. The leaf margin is commonly followed in broad leaves. There is a wide variation in size of the puparium. *M. indigoferae*, a very small fly, was collected mining *Indigofera suffruticosa* Mill. *M. dianellae*, bred from the leaves of *Dianella caerulea* Sims, a native plant, is a handsome fly, shining black with white halteres, and has a very shiny black puparium.

Subfamily PHYTOMYZINAE

Phytobia Lioy

This genus is represented by the aster leaf-miner *P. humeralis* (von Roser), a handsome black and yellow fly which caused concern in aster nurseries in Queensland about fifteen years ago. It still occurs occasionally in this host, and is common in fleabane (*Erigeron* spp.). Chemical control is possible. The fly was first recorded in Australia by Malloch (1923) as *Agromyza artemesiae* from Botany Bay. It is widespread in Europe and North America. The mine is at first short and linear in the upper palisade tissue; it then becomes a blister, often brownish in colour. The excretal pattern is a discontinuous line of black material with a final dark deposit voided by the 3rd instar, and used to cement the puparium to the mine floor. Hosts consist of only a few Composite plants. Frick (1956) records this species from the family Scrophulariaceae. There may be several pupae present where several mines have amalgamated.

Cerodontha Rondani

Cerodontha is represented by *C. australis*, a native species described by Malloch and bred from winter grass, *Poa annua* L. It causes yellowing and often death of the host leaves. It differs from other species in that the leaf punctures are elongate, not rounded, often contiguous and resembling a chain.

Liriomyza Mik

The "*Phytomyza affinis*", recorded by French in 1900 from Victoria mining cabbages and turnips was probably *L. brassicae* (Riley). This species was first taken in Queensland in Brisbane in 1911 by Tryon, when it was found mining nasturtium leaves (*Tropaeolum* sp.). In 1941 it was recorded to be depressing the market value of cabbages at Cleveland, and subsequently became a common pest. In 1949 it was classed as a major pest. This was thought to be due to the use of DDT to which the cabbage moth and its own parasites were more susceptible; it therefore lacked competition.

A spraying programme was adopted involving endrin and this eased the growers' troubles with this and other pests. The fly is widespread in distribution, and probably originated in Europe. It pupates externally. The larva emerges from the mine by chewing a slit in the upper epidermis about one cm. from the end of the mine and another line at an angle to this to form a long narrow V. If this is not large enough another line is cut to make a Y. The larva then works its way out, topples onto the leaf surface and rolls to a leaf base or the soil below. All hosts recorded here so far have been Cruciferous excepting *Tropaeolum*, *Pisum* and *Cleome*. The reason for the choice of Cruciferae, *Tropaeolum* and *Cleome* could be biochemical since all contain an enzyme necessary for the production of mustard oil. There appears no explanation for the mining of *Pisum*, however. The puparium is bright yellow, darkening to pale brown in a few days. Emergence of the adult after pupation takes 15-20 days.

Haplomyza Hendel

Haplomyza is represented by two species, *H. imitans* Malloch and *H. caulophaga* Kleinschmidt. *H. imitans* can mine leaves, petioles and stems, as does the beanfly. It has been bred from several weed species in Queensland, including *Chenopodium album* L., *Coronopus didymus* (L.) Sm. and *Stellaria media* (L.) Vill. The species pupates externally. *H. caulophaga* is a stem miner of silverbeet. It has also been suspected in Queensland of damaging beetroot stems. It is not a serious pest.

Pseudonapomyza Hendel

Pseudonapomyza is represented by *P. spicata* (Malloch). This species was originally described from material from Formosa; it has also been found in Fiji in sugarcane and corn, in Samoa, Guam and Hawaii. This is a common grass-mining species and was recorded from Queensland in 1953. It is probably not native to Australia. A common host here is crowsfoot grass, *Eleusine indica* (L.) Gaertn. The feeding and oviposition punctures lie in groups usually at the leaf tip. This is probably because the young leaves of this species are usually folded at the centre and the adult can reach the upper surface at the tip only. Pupation is external. The mined area dies and turns brown; mined plants are therefore easy to find, but unfortunately after the miner has escaped.

Phytomyza Fallén

Phytomyza is a large genus of leafminers with over two hundred species. *P. atricornis* Meigen, the cineraria leafminer, is the only species known from Queensland, the first record being by Tryon in 1907. The species is believed to have come from New Zealand during the last century. It is worldwide in distribution and probably a native of Europe. There is a long list of synonyms and a very long list of host plants, since it is one of the most widely polyphagous of miners. Hering (1951) says the species will attack all dicotyledons. To my knowledge, most records from this State are from Compositae, or rarely Cruciferae. It is well known in both parks and private gardens because it often cuts short the flowering period of the cineraria. Pupation is on the lower side of the leaf beneath the epidermis. When the infestation is heavy quite a number of whitish pupae are visible beneath each leaf. The plants soon become unthrifty, and wilt quickly in the warmer part of the day. Local experiments showed that good control is difficult, though regular use of dieldrin is fairly effective. Home gardeners often prefer to grow other plants.

Records were kept of hymenopterous parasites bred from pupae of most species. Some of these records may include hyperparasites. The families represented were Braconidae, Chalcididae, Eupelmidae, Eulophidae, Eurytomidae, and Pteromalidae. There were 13 species from the beanfly, 10 from the cineraria miner and lesser numbers from the remaining species.

References

FRENCH, C. (1900).—"A Handbook of Destructive Insects of Victoria". Part III, p. 229. (Government Printer: Melbourne)

FRICK, K. E. (1956).—Revision of the North American *Calycomyza* species north of Mexico. Phytobia. (Agromyzidae, Diptera). *Ann. ent. Soc. Amer.* **49**: 284-300.

KLEINSCHMIDT, R. P. (1960).—New species of Agromyzidae from Queensland. *Qd J. agric. Sci.* **17**: 321-337.

MALLOCH, J. R. (1923).—Notes on Australian Diptera with descriptions. *Proc. Linn. Soc. N.S.W.* **48**: 601-622.

SPENCER, D. A. (1963).—The Australian Agromyzidae (Diptera, Insecta). *Rec. Aust. Mus.* XXV (15): 305-354.