

42

**New Records of North American
Macrochelidae (Acarina: Mesostigmata)
and Their Predation Rates on the House Fly¹**

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Three species of Macrochelidae (Acarina: Mesostigmata) not previously reported from North America have been repeatedly collected from cow and horse manure in New York State in 1959 and 1960. These are *Macrocheles robustulus* (Berlese, 1904) (= *Macrocheles rothamstedensis* Evans & Browning, 1956); *Macrocheles subbadius* (Berlese, 1904) (not Evans & Browning, 1956); and *Glyphtholaspis confusa* (Foa, 1900) (= female only *Macrocheles plumiventris* Evans & Browning, 1956). *Macrocheles medarius* Berlese, 1889, reported previously from Canada (Chant 1960) but not from the United States, was repeatedly collected. *Macrocheles muscaedomesticae* (Scopoli, 1772) (= *Macrocheles muscae* Ewing, 1913) was also repeatedly collected from domestic animal manure.

Identifications were verified by Alessandro Filipponi, Istituto Superiore di Sanità, Rome, Italy, who has access to the Berlese collection and has published extensively on the Macrochelidae (1955, 1957, 1960). The synonymies of *M. robustulus* and *M. subbadius* are by Filipponi (1961) and the synonymy of *M. muscaedomesticae* by Pereira and de Castro (1945).

The rates of house fly (*Musca domestica* L.) egg and first-instar larva destruction by the adult females of four species were compared, using mites reared in the presence of cow feces and house fly eggs. New cultures of each species were established 2 months prior to this study from 20 females of each species taken from existing laboratory cultures which had been established the previous summer from infested horse and cow manure.

To determine the number of eggs and first-instar larvae destroyed per mite, 15 house fly (CSMA strain) eggs laid during the preceding 8 hours were placed on a moistened green blotting paper rectangle (1 x 0.5 in.) in a 3-dram polystyrene vial with polyethylene "snap cap." One adult female mite was placed in each vial and held at 80°-82° F. After 12 hours the mite was transferred to another vial containing fresh eggs and blotting paper. The number of intact first-instar fly larvae and the number of collapsed egg chorions were counted per vial. The difference between these counts was the number of eggs and first-instar larvae destroyed by the feeding mite. The final number of eggs and first-instar larvae destroyed per mite per day per replicate is based on six counts made at 12-hour intervals during a 3-day period. In the course of this study 1440 counts were made and mite nymphs were found in the vials on 38 occasions.

The accuracy of this counting method was investigated by maintaining control vials containing eggs but no mites for five successive 12-hour periods simultaneously with the first replicate of the experiment. Counts were made on a total of 50 such control vials, with the number of intact fly larvae equaling the number of collapsed chorions in all vials except three. A total of four collapsed chorions was counted in excess of the number of intact larvae out of a total of 305 collapsed chorions, giving a counting error of 1.3%.

A randomized complete block design was used with each treatment composed of 10 mites in individual vials.

Six replications were made over a 26-day period. The results are presented in table 1.

Interspecific differences between ranked means of number of eggs and first-instar larvae destroyed per mite per day were compared using the Student-Newman-Keuls test. The difference between *M. muscaedomesticae* and *M. subbadius* was not significant at the 0.05 probability level. All other possible comparisons were significant at that level.

Table 1.—Rates of house fly egg and first-instar larva destruction by adult females of four species of Macrochelidae.

Species	Mean ^a	Standard error	Range	Intra-specific variance (s ²)
<i>G. confusa</i>	9.9	0.97	7.4-13.2	21.6
<i>M. robustulus</i>	4.6	0.32	3.3-5.6	2.3
<i>M. muscaedomesticae</i>	2.7	0.35	2.1-4.3	3.7
<i>M. subbadius</i>	1.2	0.09	0.9-1.5	0.8
Analysis of variance:				
	df	SS	MS	F
Treatment	3	259.9	86.6	42.2 ^b
Replicates	5	4.6	0.9	0.5 ^c
Error	15	30.7	2.1	

^a Number of eggs and first-instar larvae destroyed per mite per day.

^b Significant at 0.01 probability level.

^c Not significant.

Intraspecific variances (s²) of *M. muscaedomesticae* and *M. robustulus*, compared by the F-test, were not significantly different at the 0.05 probability level. All other possible comparisons were significant at that level.

These results indicate that several species of Macrochelidae should be considered in any investigation of the role of mites as natural control agents of the house fly. The frequency of occurrence of these Macrochelids in domestic animal manure and factors influencing their predation rates on house fly eggs and larvae are currently being investigated.

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