

THE  
ENTOMOLOGIST'S  
MONTHLY MAGAZINE

VOLUME LXXXIII  
[FOURTH SERIES—VOLUME VIII]

DIPTERA IN THE SPATHES OF *ARUM MACULATUM* L.

BY THE REV. PROF. L. W. GRENSTED, D.D., F.R.E.S.

The importance of the females of *Psychoda phalaenoides* L. for the pollination of the flowers of *Arum maculatum* L. is well-known to botanists, and the curious structure of the flower, with the ring of filaments forming an incomplete but sufficiently effective trap for the flies is familiar enough. A. E. Eaton, 1898, *Ent. mon. Mag.*, **34**:122, recorded this, mentioning only the females of *P. phalaenoides* L. as agents, and stating that the flies so trapped had to remain until the filaments withered and set them free. F. W. Edwards, in a footnote to A. L. Tonnoir ('A Synopsis of the British Psychodidae (Dipt.), with descriptions of new species, 1940, *Trans. Soc. Brit. Ent.*, **7**: 51), corrected this statement and made it more precise. With Mr. Coe he identified 198 specimens of *Psychoda* from *Arum* spathes, and found that 158 were *P. phalaenoides* L., all being females, but that five other species also appeared, viz. *P. grisescens* Tonn., 14 ♂♂ and 19 ♀♀; *P. trinodulosa* Tonn., 2 ♀♀; *P. brevicornis* Tonn., 1 ♂ and 2 ♀♀; *P. setigera* Tonn., 1 ♀; *P. severini* Tonn., 1 ♀. He also noted that the flies can and do come out freely past the filaments when the plant is tapped, so that the trap is not wholly effective, and suggests 'that intoxication may be the cause of many of them remaining below.'

It seemed worth while to repeat this enquiry and to verify the facts as far as possible in a limited area, and during this spring I examined over a hundred *Arum* spathes in the Oxford district. A majority contained no flies at all, though some were occupied by spiders, many by slugs, a few by mites, and a few by insects of other Orders. Many had evidently not reached the stage of development at which they become attractive to the flies.

Table I gives the detailed results for the spathes in which flies were found. Wytham Hill and Botley are in Berkshire, the other localities in Oxfordshire.

In explanation of the table it should be noted:

- (1) That each entry represents one spathe.
- (2) That there was a sharp change in the weather after April 23rd. Up to that date it was cold and dry, with frost at nights. By April 26th it was warmer and moist, after showers and south-west wind. There was an obvious increase in the number of flies in the spathes.
- (3) That in the two cases where a considerable number of flies were identifiable they were probably nearly all *P. phalaenoides* L. In the second case the spathe was old and had closed in at the top, and the flies were dead and much decayed.

The general result of the enquiry is to show that *P. grisescens* Tonn. is a more important visitor to the spathes than Edwards's note suggests, and that though males of this species are not infrequent, the females outnumber them by five to one. In the earlier part of the investigation, and in roadside localities which were open and exposed to the weather, *P. grisescens* Tonn. actually outnumbered *P. phalaenoides* L., and in fact the great preponderance of the latter species rested entirely upon its prevalence in one locality, a damp glade with much vegetation in the Parks at Oxford.

TABLE I.—DIPTERA FOUND IN *ARUM* SPATHES

Locality and date	PSYCHODIDÆ:		SPHAROCERIDÆ:					CULOXORIDÆ:					
	<i>Psychoda</i> sp., ♀	<i>P. phalaenoides</i> L., ♀	<i>P. grisescens</i> Tonn., ♂	<i>P. grisescens</i> Tonn., ♀	<i>P. setigera</i> Tonn., ♀	<i>Limosina</i> sp.	<i>Limosina</i> sp.	<i>L. nana</i> Rond.	<i>Opacifrons coxata</i> Steinh.	<i>Coprophila ferruginata</i> Steinh.	<i>Trichiaspis equina</i> Flin.	<i>Euloxioridæ:</i>	<i>Elachiptera cornuta</i> Flin.
Elsfield, 16.iv ...	...	...	1	...	...	...	...	...	...	...	...	...	
Ditto ...	...	...	...	7	...	...	...	...	...	...	...	...	
Ditto ...	...	1	1	11	...	1	1	...	...	...	...	...	
Ditto ...	...	...	1	3	...	...	...	...	...	...	...	...	
Wytham Hill, 22.iv ...	...	1	...	...	...	...	...	...	...	...	...	...	
Ditto ...	...	...	...	...	1	...	...	...	...	...	...	...	
Botley, 23.iv ...	...	2	...	...	...	...	...	...	...	...	...	...	
Ditto ...	...	3	...	7	...	...	...	...	...	...	...	...	
The Parks, Oxford, 26.iv	18	111	1	15	...	...	...	...	...	...	...	1	
Elsfield, 27.iv ...	...	...	...	1	...	...	...	...	...	...	...	...	
Ditto ...	...	9	...	2	...	...	...	...	...	...	...	...	
Woodeaton, 27.iv ...	...	2	...	...	...	...	...	...	...	...	...	...	
Ditto ...	...	5	3	2	1	...	...	1	...	...	...	...	
Old Marston, 27.iv ...	...	1	4	...	3	...	...	...	...	...	...	...	
The Parks, Oxford, 30.iv	1	7	...	2	...	...	...	...	...	1	...	...	
Ditto ...	...	4	2	...	1	...	...	...	1	...	...	...	
Elsfield, 1.v ...	...	...	3	...	...	...	...	...	...	...	...	...	
The Parks, Oxford, 4.v	40	1	1	...	...	...	...	...	...	...	1	...	
Ditto, 8.v ...	...	...	...	2	...	...	...	...	...	...	...	...	
Ditto, 15.v ...	...	1	15	...	1	...	...	...	...	...	...	...	
Total ...	...	79	155	10	54	1	...	1	1	1	1	1	

Collecting upon the windows of my own house in Oxford confirms this finding. *P. grisescens* Tonn. appeared early, and it was not for some time that *P. phalaenoides* L., and later *P. brevicornis* Tonn. overtook it in numbers. *P. setigera* Tonn. also appeared in my house, with two other species, *P. severini* Tonn. and *P. humeralis* Mg., which did not visit the spathes.

There is nothing in this evidence to conflict with Tonnoir's view (*loc. cit.*) that the form of *P. phalaenoides* L. found in the spathes is parthenogenetic. It would have cost much labour to verify that the specimens taken were all of his sub-species *elongata*, a form only differing in the proportions of the internal sensory organ of the subgenital plate. I confess that I am not happy about this sub-species. Tonnoir himself notes that the critical internal sensory organ varies in shape in the sub-species, and it seems very possible that what really happens is that under certain conditions of climate and environment (perhaps even under a stimulus emanating from the curious club of the *Arum* flowers) the ordinary *P. phalaenoides* L. develops a parthenogenetic race, marked by certain slight, but

highly significant changes in the reproductive organs. It is noteworthy that Tounoir remarks 'Of this new sub-species I have seen only females,' and, of course, there seems to be agreement among all observers that only females occur in the spathes. But there is no evidence that the true male of the alleged sub-species is not simply the ordinary male of *P. phalaenoides* L. *sensu stricto*, and I am inclined to believe that when some ingenious observer has been able to conduct breeding experiments this will prove to be the case.

It may be added that in a few cases a Nematode larva, almost as long as the fly itself, emerged from the *Psychoda* when they were immersed in spirit.

The other species found were obviously strays, and are mainly interesting as occurring in a situation very unlike their usual habitat. The *Arum* flowers obviously have a special attraction for the species of *Limosina* (*sensu lato*), but not upon a scale important for their pollination, or in any way comparable with their attraction for *Psychoda*.

Oriel College, Oxford.

September 9th, 1946.

*Buprestis aurulenta* L. (Col.) in England.—Amongst the beetles sent in to the Ministry of Agriculture and Fisheries Plant Pathology Laboratory, Harpenden, for identification was a specimen of *Buprestis aurulenta* L. which had been found among potatoes on an allotment at Meir Longton, Staffs., at the end of September, 1946. Mr. E. B. Britton, of the British Museum (Nat. Hist.), who kindly identified the specimen, informs me that it is a native of Western North America and has been imported into various countries. Essig (1936. *Insects of Western North America*: 398) states that Douglas fir is the preferred food-tree of the larva, and that it also occurs in red cedar, spruce and various pines. The specimen was probably imported into this country with timber.—H. McD. EDLSTEN, Plant Pathology Laboratory, Harpenden: October 14th, 1946.

Three Plume-moths new to the Hebrides.—All three of these species were captured on the Isle of Rhum, and the forms represented were *Alucita tetradactyla* L., *Pterophorus monodactylus* L. (Lep., Pterophoridae) and *Orneodes hexadactyla* L. (Lep., Orneodidae). The first-named was taken flying in the daytime over a bed of thyme growing along the edge of the 100 ft. late glacial raised beach at Harris on the extreme south of the island. *P. monodactylus* occurred at blossoms of the Sallow, *Salix atrocinerea* Brot., in April at Kinloch, the head of Loch Scresort. On the other hand, *O. hexadactyla* was boxed from grass in August, 1946, in a small but beautiful gorge, carrying a rich fauna, on the north side of Glen Sheilesder. There it was attached to the Hebridean honeysuckle *Lonicera Periclymenum* var. *Clarki* Heslop Harrison. The isolation of this colony points to an existence of very long duration.—J. W. HESLOP HARRISON, King's College, Newcastle upon Tyne: October 14th, 1946.

*Aulacaspis rosae* Bouché and *Lecanium capreae* L. (Hem., Coccidae) recorded for the first time from the Outer Hebrides.—The latter species in the past has proved to be quite common on hawthorn on Rhum, but until the present season it had not been detected in the Outer group. In August, as is usually the case, I spent a considerable time exploring the wooded gorge of the Allt Volagir which flows down Beinn Mhor into Loch Eynort, Isle of South Uist. In beating the birches for Aphididae, I was astonished to discover that the twigs carried considerable quantities of *Lecanium capreae*. A few days later, whilst working on Stuley Island to the east of South Uist, I made a close inspection of the little copses of *Salix aurita* L.; once again, to my surprise, I noted considerable numbers of *L. capreae*. Later, on a sprawling plant of *S. repens* L., growing on a cliff, the same 'off' type, and await further study. However, this was not the end. As none of us had ever visited Bolam Bay to the east of the Beinn Mhor ridge, I determined to climb over the col between it and Ben na Hoc. There in a valley, narrowing as it approached the sea to a very deep gorge which was quite inaccessible, I was on ground, in all probability, never visited before by anyone except a casual shepherd or two, and thus in many respects untouched. Large collections were therefore made of plants and insects. Amongst the former were wild roses belonging to a critical group of *Rosa dumalis* Bech. On my return to my headquarters, these were studied closely when, to my amazement, I found that at the base of nearly every prickly was a specimen of *Aulacaspis rosae*—a species new, not only to the Outer Hebrides, but also to Scotland. The problem of this case of discontinuous distribution provides much scope for reflection when the remote nature of the station, far indeed from human habitation, is considered.—J. W. HESLOP HARRISON, King's College, Newcastle upon Tyne: October 14th, 1946.