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MOVEMENTS OF COCCINELLIDAE.

By T. F. MARRINER.

(Plate VIII.)

Inclement weather and a chill kept me indoors for the early weeks of 1939. I spent part of my time in going through some old note books and, coming across some unpublished though incomplete notes on movements of Coccinellidae, I gathered them for the purpose of this short article.

Three terms are applied to such movements: migration, swarming, and massing. These terms, I find, are sometimes but loosely made use of and in these notes I apply "migration" to movements from one country to another; "swarming" to movements from one area of a country to another area of the same country; and "massing" to the gathering of the insects in an area to some spot in that area.

Working with these meanings the only member of the British *Coccinellidae* I can discover as migrating is *Adalia bipunctata*, L. This species, as has long been known, migrates periodically from France. There is a record of such a migration in 1869, when the streets of London swarmed with the species. There is also a record of a migration when the numbers alarmed the citizens of Reading. Another migration occurred in 1872 and was noted to the west of Middlesbrough, where the crowd took a few days to pass on north. I have, myself, observed two of these migratory crowds, in each case passing east to west through the Tyne Gap in the Pennines, and it was in the case of the second of these migrations that the accompanying map was compiled. I had gone into the station at Carlisle to take train to Hexham in June 1925. When the train arrived from Newcastle I was on the platform near where the engine stopped and noticed a number of *A. bipunctata* on the engine and first coach. The train fireman noticed me looking at them and volunteered the information that they had come through crowds of them between Hexham and Carlisle. When the train drew up at Heads Nook station I saw my friend the late Mr G. B. Routledge on the platform. He came up when I put out my head and shouted, "Have you seen the two-spots, hundreds of 'em?" At Hexham I went to a market garden and found the place overrun with them and was told that there were none to be seen there the day before. On my return home I went to see Mr Routledge, and between us we wrote to some 80 people asking about ladybirds. We got some 50 replies and from these the map was compiled. It shows the route but unfortunately we were unable to add the timing from such replies as "the other day," "last week," "last Wednesday or Thursday," etc. Most of our correspondents were not scientific. From data gathered here and elsewhere I noted that *A. bipunctata* appears always to fly low, keeping not far above the ground and passing through gaps rather than rising to pass high land. This agrees with the point that many are caught by high waves when crossing the Strait of Dover or the Channel and are washed up on our south east coast. It will be noted on the map that the route avoids the Peak, and that gaps are made use of. Hereford was not touched and this is, I believe, usual, for I have an old letter from a friend who states that when he lived

there it was a custom to import boxes of the insects from France to set free in gardens and orchards there.

It would appear that an early, warm spring in France leading to quick maturing and consequent overcrowding may be responsible for the migration movement. These migrations are not of regular occurrence and if small seem to be absorbed by our south country, and this may probably account for the fact that the insect is at times not a common one in the north. As the migrating crowd comes north numbers break away and spread over suitable areas. Two points struck me as noteworthy in connection with these migrants. First of all of numbers taken from them in each of two cases over 60 per cent. were females, and second that all were type or nearly type forms. I never saw either *4-maculata* or *6-pustulata* among them. The first point I should like to deal with in a later note. The second point adds confirmation to an old theory of mine, that the dark forms are autumn bred and the migrants would be first brood.

So far as I have been able to gather no other species of our *Coccinellidae* seems to migrate. *C. septempunctata*, L. swarms, using the term as above stated. According to an old MS. in the Hancock Museum at Newcastle such a swarm appeared near Newcastle in 1750, and in 1826 Mr Albany Hancock says several hundreds were sent to him, caught a little south of Newcastle. Whence they came is unknown. I witnessed such a swarm on one occasion when on a visit to the Gullery, Ravenglass. I was standing looking across the gullery when some hundreds of the insects appeared, coming from the south and settling on the grass all around me. While *A. bipunctata* flies low down and goes through gaps in hills, *septempunctata*, a stronger flier, flies higher and when meeting high land goes straight on over the top. I noted this when one day on the top of the Pennines, a little south of Brampton, when a swarm appeared from the east and flew over the fell tops towards the west.

C. 11-punctata, L. also swarms, and this has been observed in our own country, on the Continent, and in the Sudan. Mr T. J. Bold, in the *Natural History Transactions of Northumberland and Durham*, 1873, p. 33, speaks of *C. 11-punctata* "appearing in some years near the coast in such profusion that every stone, brick, or clog of wood lying on the sandy bent will be reddened by congregated hundreds, but whence they have come and why is one of those perplexing questions which it is impossible to answer satisfactorily." G. B. Longstaff, M.A., M.D., writing in the *Proc. Ent. Soc. London*, 1909, p. xxxii, and in the *Ent. Monthly Mag.*, 1911, p. 195, describes a swarming of *C. 11-punctata*, L. near Khartum, February 16, 1909. There was a gentle breeze from the westward and the insects came from the eastward. The flight lasted over an hour.

I have noted more than one such swarming on the Cumberland coast, the most noteworthy being in August 1926, when a swarm came from the south west against a very gentle north east breeze and settled on the north east part of Burgh Marsh on the Solway. A friend holidaying there sent me word of the swarm and I went there some days later with Mrs Merritt Hawkes, M.Sc., who was staying with me at the time. We were able to work out here the life-history of the species as recorded in *Trans. Ent. Soc. London*, July 18, 1927.

It will be noted that in each case the swarming of *C. 11-punctata*, L. was against the wind (a gentle wind). In view of what was discovered on Burgh Marsh as recorded above, it seems probable that the scent of cattle and fresh dung, carried by the wind, attracted the insects and so was responsible for the swarming. Similar swarmings are also recorded from the salt marshes of Lorraine.

In the case of *C. 10-punctata*, L. the insects of an area appear to mass for the winter months, and, so far as I have been able to discover, the sexes do not mass together. I found one mass of some hundreds clustered all head inwards in a deep hollow where a big branch joined the main trunk of a lime tree, of which all I examined were females. Another mass was in a rotted hole of an old gate post, also all head inwards and apparently males. I have also found *Mysia oblongogutta*, L. massed for hibernation under leaves between exposed root branches of a pine tree.

With regard to our other species, my notes do not afford sufficient data to make any definite statement, and as I now live in an area where apparently *Coccinellidae* are but rare, I am afraid I shall have little or nothing to add and must leave further study of these movements to others.

CONTINUOUS BREEDING. VI. TAENIÖCAMPA GRACILIS, F.

By H. B. D. KETTLEWELL, M.A., M.B., B.Chir.

(Continued from p. 89.)

The original parent can be taken at sallow in April. Wild larvae are found easily when once the technique is learnt. When young they spin together three or four leaves of sweet gale edge to edge, the end being left open. These can easily be recognised and large numbers collected. In districts where sweet gale does not occur meadow sweet is a favourite foodplant. When full grown the larva is rarely seen as it descends from the plant by day. However, it was observed this year by Demuth and others that large numbers of full-grown larvae could be found sitting high up on grass stems, etc., an hour or so before dawn. Before midnight none was to be found.

Continuous breeding of this species is easy. A very large wooden box has a foot of earth placed in the bottom. Cuttings of willow and sallow are stuck into this in the autumn and the majority take root and leaf the following year. Among these in the spring are placed numbers of dead heads of knapweed flowers and dead rush. In these the ♀ *gracilis* lay their eggs.

The selected male and female are introduced into this and the box covered over with muslin.

Full-grown larvae can be collected from here in June and are hand-fed for a few days prior to pupation in coconut fibre.

The pupae are dug up and placed on top of coconut fibre and covered with a considerable thickness of moss. The flower-pot is stood in shallow water in the open throughout the winter. During this time the moth is fully formed within the pupal shell.

Variation in this species is extreme and local, half-a-dozen different forms occurring in one locality, while in another little variation is



Ent. Rec. and Journ. of Variation.

del. T. F. Marriner.

MIGRATION OF ADALIA BIPUNCTATA, 1925.

Dots show observation points.